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A COMPARISON OF ORTHODOX AND EXISTENTIAL PSYCHOANALYTIC CONCEPTS OF ANXIETY

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This paper intends to survey and analyze the concept of anxiety primarily as it has been viewed from orthodox and existential analytic viewpoints with a brief mention of some of the intermediate approaches. It might seem a great over-simplification to consider merely two schools of analytic thought from the thirty-six systems now claiming the most useful or valid approach (15), but it may be rewarding to contrast the thinking of the school which has adhered closest to Freud's original thinking with one of the most recent developments under the influence of contemporary philosophy. It is, fortunately, not too difficult empirically to categorize anxiety by descriptive symptomatology, and this serves a useful clinical purpose by facilitating diagnosis and indicating different therapeutic approaches. Thus, there could be little disagreement that these symptoms indicate anxiety: unwarranted anticipation, feelings of subjective uneasiness, apprehensive expectation, fears of going to pieces, and a helpless reaction of being unable to take effective action; there are also autonomic physiologic concomitants primarily in the muscular, cardiovascular and gastro-intestinal systems that would indicate the presence of anxiety in one form or another. Anxiety may be the primary diagnosis or one of the manifestations of a more concealed condition. This paper, however, will not discuss these phenomena but rather consider and explicate the concept of anxiety, its development and meaning; this must necessarily involve psychodynamic and philosophical considerations. Analysis of classical analytic thinking immediately shows that anxiety is predominantly viewed as a clinical, biological or intrapsychic process, and in so viewing it an attempt was made to find the causes for its development, rather than to analyze its meaning in a broader sense. There was little emphasis on what the term meant or implied outside of the individual's development and within his family setting.

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I

The view on anxiety adhered to by Freudians can only be understood by a genetic approach which considers the varying influences on the infant as he progresses through the stages of psychosexual development. The infant experiences *primary* anxiety due to his biological helplessness which floods him with tension and excitation beyond his capacity to master; the pain foreshadows that of later anxiety. Anxiety is thus partly a sensation of involuntary vegetative emergency discharges due to tension—a lack of physiologic homeostasis or equilibrium (26). Freud suggested that primary anxiety is established in the trauma of parturition, which Rank later proposed as not only the prototype of anxiety but as the source of all neuroses (33). The crucial point is that anxiety is not created actively by the ego but by outer and inner stimuli impinging on a defenseless and passive ego. Such trauma may be repeated in later life when the ego is overwhelmed or flooded by amounts of excitation, usually sexual or aggressive in na-

ture, it cannot handle: a condition of *traumatic* anxiety is then said to exist.

As the child matures he learns to tolerate tensions with individual variations determined by "constitutional" factors and the various developmental experiences he has had; he may control anxiety to a certain extent, especially for anticipatory purposes. When the ego has the capacity for anticipating, it has the correlative capacity to prepare itself for new anxiety-producing situations. In this case the ego is using anxiety, and we note the fear of re-experiencing a traumatic state producing anxiety. Occasionally the warning system fails, so that a judgment that was supposed to prevent a state of trauma actually induces it. This occurs most frequently when the individual is in a susceptible, "dammed up" state. This is then called anxiety hysteria or an anxiety reaction, but it also occurs in people temporarily overwhelmed by paralyzing panic.

What the Freudians hold to be the content of the primitive ego's idea of anxiety, is of great interest. It is partially determined by its biological nature and in part by animistic ways of thinking which interpret the environment as having the same or more powerful instinctual aims than itself. The primitive talion principle by which any deed may be undone or must be punished by a similar deed inflicted on the doer, is basic to the primitive ego's way of thinking. So the infant fantasies his own instinctual demands as dangerous, and gratifying them can lead him to traumatic states (9). The neurotic conflict between the ego and the id is formed by the ego's opposing the instincts (which are best thought of as physicochemical changes causing a sensory stimulus) because it believes them to be dangerous. One result of this anxiety over the possible experience of future traumatic states is the development of a fear that no means of satisfaction will be obtained. This fear is that of losing help and protection, or losing love, on all of which self-esteem depends; as these fail, so one feels more deserted. The animistic way of thinking adds an exaggerated and unrealistic element to the anxiety state, resulting in fantasies of physical destruction dominated by castration, the fear of which puts to work the defensive ego. This animistic thinking is closely related to the already mentioned birth trauma, since the danger of castration is to the child the loss of or separation from a loved object. As Freud pointed out, all later anxiety reactions signify a figurative separation from the mother, ranging from a literal fear of castration in the phallic phase to a fear in the ego of a lack of superego supplies in latency, and even to the later fear of death. (Castration fears which everyone has experienced are often equivalent to the fear of death (11).) The anxiety from the loss of the mother was considered comparable to that from castration—also a loss, and one which would forever destroy the possibility of copulatory union with the mother. In females the castration complex resulted in tender feelings for an object (object cathexis) replacing the narcissistic investment in a penis. This explains the observed greater dependence on a love-object and fear of its loss in women.

One way the ego attempts to control its anxiety is by repetitions of events that represent the traumatic situations. This is seen in the games of children and in their dreams (9, p. 44). The significant difference is that in these situations the ego is in control and is not in a situation of being the passive recipient. Overcoming a situation which once frightened him gives the child pleasure as it frees him from anxiety; this is called *functional pleasure*, and it leads children's play from mere discharge to a feeling of accomplishment. Non-neurotic adults have an absence of both anxiety reactions and functional pleasure, as the ego is sure of itself and no longer keeps itself in a state of anxious anticipation (25). In neurotics, character traits are considered secondary elaborations of neurotic symptoms, mostly of infantile anxiety reactions. As mentioned previously the neurosis is believed to be a breakdown of

adjustments in the helpless ego. Certain neo-Freudian writers, however, seem to have regarded it as a planned arrangement of adjustments to conflicting situations (19). The secondary attempts at adjustment try to amend the original maladjustment and prevent similar situations in the future. The result is a curtailment of the freedom and flexibility of the ego, and a character structure with an ego inflexible enough to protect itself against anxiety-provoking stimuli. There are different techniques for seeking reassurances against anxiety, but they are usually ineffective because the real cause is unconscious.

Looking on this kind of material with some perspective we must acknowledge that Freud's contributions to the problem of anxiety were monumental. He initially viewed anxiety as due to the individual inhibiting dangerous libidinal impulses which he represses and which are then automatically converted to anxiety (11). Later he emphasized the importance of the ego as the "true abode of anxiety" in stressing its role in perceiving danger and repressing the impulses to avoid anxiety. "It is not the repression that creates the anxiety but the anxiety is there first and creates the repression" (10). The symptoms result from the attempt to avoid anxiety. This was a reversal of the first view, that of repression causing anxiety, to anxiety causing repression. The earlier theory is seen almost entirely as an intrapsychic process involving libidinal displacement, while the later theory became more cognizant of the external threat which the ego was trying to avoid. Freud formulated his thinking on anxiety as the crux of the neuroses into a threefold approach (11, p. 99). First, the biological basis of anxiety was rooted in the helplessness and dependency of the young human; the helpless state was held to be productive of the first situations of danger and the correlated need to be loved. Second, a phylogenetic factor was inferred to explain the latency period; he described this as due to "something momentous to the destinies of the human race" having occurred which left behind a "historical precipitate." The ego's treating the instinctual demands of infantile sexuality as dangerous, led to the importance of latency. Thus sexual impulses of puberty were also regarded as alien to the ego, and like their infantile prototypes, could be repressed. Third, there was a specifically psychological approach traceable to the environment, in which symptoms develop from the restriction of the instinct.

It would be misleading to ignore the modifications of this theory that have been made by groups that have attempted to stay closest to Freud's teachings. The theoretical position regarding anxiety which is taken by post-Freudian classical thinkers is usually that of an attempt to re-interpret Freudian theory by synthesizing these concepts into an adaptational psychology, while yet retaining instincts and libido theory. Much of this work has dealt with efforts to elaborate on the function of the conflict-free, autonomous ego (16). Another group has been quite critical of the use of libido and instinct theories to explain anxiety, and has attempted to view anxiety more as a result of environmental interaction than of intrapsychic forces. "Anxiety turns our attention first to the perceptual apparatus, and then to the defensive devices which protect the organism against the dangers which have been perceived, both real and illusory. An adaptational psychology of the ego assumes these processes to be functions which are shaped from the beginning of life by interaction with external environmental stimuli, not by intrinsic forces within the organism alone. It does not matter how ingeniously adaptive phenomena are reinterpreted in the language of the libido theory. Such explanations remain tautologies which provide no new knowledge" (20).

II

Before examining the concept of anxiety from an existential viewpoint, the positions of some transitional groups should be men-

tioned, because some believe a gradual development has taken place, culminating in the increased prominence of existential concepts. As this report is not a comprehensive analysis of all views of anxiety, but rather an attempt to contrast two prominent views that could be considered at opposite ends of a continuum, some of these other approaches must be characterized in no more than a sentence or two. This, of course, does not represent a value judgment, but simply reflects limitations of space. Most of the nonorganic, experimental approaches have been made by psychologists who base their work on learning theory. A general scheme will be presented which it is hoped contains, though in an over-simplified way, the essence of their thinking. Their basic tenet is the belief that anxiety, besides being a learned reaction, is itself a potent stimulus for learning. Attempts to lessen anxiety may result in a vicious circle of further symptoms to be anxious about. Anxiety develops in response to cues (conditioned stimuli) that have the function of warning signals against situations that have been painful in the past (unconditioned stimuli). Maladaption would be *via* techniques that give short-term rewards by reducing anxiety, but do nothing to change the conditions producing it. As such these are self-perpetuating by the law of effect, which holds that the organism learns most quickly the reactions that reduce tension. The person with an anxiety reaction pattern would be one who lacks perspective to see beyond the immediate case and is not aware of long-range cumulative effects. The explanation for this involves the "gradient of reenforcement": the greatest effects are of actions which lie closest in time to their performance (15, p. 119). These observations all deal with the effects of anxiety *per se* and not with the question of what anxiety means —in a more conceptual sense—to learning theorists. Mowrer has done a great deal of work and has written extensively in this area; his early discoveries that rats developed an "anxiety-fear reaction" based on a conditioned form of pain response led to a consideration of man's ability to see future consequences of his acts. His development of a "guilt theory" of anxiety rather than an "impulse theory" is based on conflicts regarding social fears (fear of loss of esteem from important environmental figures) due to "irresponsibility, guilt and immaturity" and "repudiated moral urgings" (31). Another example of a rather abstruse approach to learning problems and symptoms such as anxiety is that of Eysenck, who follows a hypothetico-deductive method from "formal postulates" of personal characteristics to a theoretically determined analysis which tests empirical results (8). It appears to this writer that although such an approach may have merit for learning theory *per se*, its value in attempting to explicate the concept of anxiety from a philosophical viewpoint, much less a clinical one, is lost in a maze of hypotheses which hinder rather than aid a clear analysis.

An area of closely related organic, experimental work on anxiety has attempted biological explanations. Much of the original work here was done by Cannon, whose views on the physiology of emotion and homeostasis result in considering anxiety as a state of biologic disequilibrium (6). More recent work has tended to stress a holistic trend. In Goldstein's initial work on brain-injured patients, he held anxiety to be a subjective experience of the organism in a catastrophic condition, where it could not handle the demands put on it and thereby felt its very existence threatened. In this kind of situation there is no specific object for the relation between self and objects, and the result, according to Goldstein, is anxiety. Despite differences in their approaches the similarities of his conclusions to existential writers is evident (14). Goldstein has more recently stated that anxiety has one constant element—"there is always a discrepancy between the individual's capacities and the

demands made on him which makes self-realization impossible" (13). Work is also being done along neuro-physiologic-chemico-hormonal lines in the attempt to get at a biological substratum that is seen in anxiety states.

So many psychoanalytic writers, from divergent schools, have made contributions to the concept of anxiety that only a few of the more prominent can be mentioned. The views of Rank have already been alluded to. The early deviants from Freud varied widely from his views. Adler, for instance, held that everyone had inborn physical states of inferiority to be accentuated by organic or interpersonal factors. Such feelings of inferiority are nearly equivalent to anxiety states; he holds they serve as a means of evading responsibilities, and also of gaining control over others by manipulating them to achieve superiority (1). Jung implies that anxiety is based on the patient's fear of the irrational forces, in the collective unconscious, breaking through to his conscious state. Jung does not seem to have well crystallized his thinking in this area, but instead becomes involved in much speculation (27). His followers appear to ascribe anxiety to the loss of contact with a spiritual power symbolized by gods, mythical figures, and the like. The consequence of rationally directing and controlling nature is held by these writers to be equated with less control over one's own psyche.

Two of the more recent neo-Freudian groups must be considered in order to illustrate the more holistic cultural approaches that have been developed. Sullivan has stressed the threat of disapproval in interpersonal relations as the cause of anxiety. Anxiety first develops in the interpersonal setting between an infant and important persons, especially the mother; from the contact between them the infant develops an awareness of acceptance or of rejection. (If the infant is shown love, respect and tenderness, he feels worthy of love and self-esteem; if not, he feels rejected.) Rejection gives rise to a sense of discomfort. The anxiety has the effect of restricting activities to those the infant thinks will avoid anxiety-producing experiences, but not only are activities inhibited but also one's own self-awareness, since whatever thoughts would arouse these feelings become "dissociated." The result is that the instrument of anxiety narrows consciousness, and the person becomes an "inferior caricature" of what he might have been, with his relationships slanted by partially fantasy-based "parataxic distortions" (35).

Karen Horney and her associates have also emphasized the cultural setting, not only in the sense of a cultural background, but in the sense of the specific milieu of the child out of which anxiety develops. Contrary to earlier analytic thinking, which—Horney believes—holds the environment important mainly as something the instincts must contend with, the environmental setting is considered a most important factor. Instincts become important insofar as they have value in this total configuration. Horney has maintained that Freud actually did not place enough emphasis on the crucial importance of anxiety. She holds it to be the "core" of the personality, and feels that Freud had "not seen the all-pervasive role of anxiety as a dynamic factor driving toward certain goals" (19, p. 76). An entity of "basic anxiety" was postulated that motivated the neurotic defenses; it developed in early relationships between the child and his environment and was the basis for later neurosis. The dependency on parents, necessitated by helplessness, is always full of anxiety because hostile impulses threaten the dependency relationship and must be repressed. The unconscious conflict between hostility and dependency, and the resulting inability to focus on real danger or view things with true perspective, further adds to the feeling of helplessness. Thus, later anxiety would be due to situations that threaten

one's security and that reinvoke the former feelings and defenselessness which were present in basic anxiety. In adult anxiety threats to the intactness of the neurotic defenses, that function as safety devices, produce a state of anxiety. In Horney's system a vicious circle is set up between anxiety and hostile impulses. The unconscious hostile impulses are basic to anxiety. Critics point out that while Horney has given some credit to the childhood origins of anxiety, her emphasis is on the current, experiencing situation which invokes anxiety by one's ongoing interactions with others. She stresses the cultural relations of our contemporary civilization, with its characteristic hostility-anxiety sequence, and in the opinion of some critics does not pay enough attention to genetic factors (18).

With this gamut of views on the problem of anxiety, one might reasonably ask why so many approaches have been developed. It would appear that the various views reflect attempts to analyze the same phenomenon from different perspectives, and with a limited amount of knowledge. By analogy one may consider a disease process from the viewpoint of the surgeon or the pathologist. This is not to maintain that there are no genuine conflicts, and no overlapping between alternative approaches. Rather, it is hoped that someday a synthesis can be made, of the various contributions, for a unified view of anxiety.

III

As distinguished from much of the previous material, the analysis of existential concepts of anxiety cannot be approached solely by clinical or experimental studies, for it becomes more comprehensive and extends into the realms of philosophy, literature and theology. In addition, existential concepts have broad cultural implications which cannot be developed here. Although many people regard existential analysis as an integral part of the post-war boom in existential philosophy, in particular the interest in Jean-Paul Sartre, most existential psychoanalysts are careful to avoid being identified with one philosophical approach. Existential analysis claims merely to be a new approach and not an entirely new "school," and thus all schools of analysis, from eclectics to Freudians, have had the chance to either accept or reject it. Philosophically, of course, it has attracted a wide variety of adherents. Existential psychoanalysis shows a steady development from 19th century philosophy, and it will be necessary first to consider its background in this connection.

There are a number of common themes running through existentialism, although the most striking feature is its diversity and individuality. It is often stated that its approach is ontological (concerned with being and reality) and based on appeals to human experience, reflection and analysis (17). Ontologically, existentialism has emphasized existence rather than essence, a point which will be elaborated on below, contrary to the methods of science which seek universal abstractions with little or no regard for the particular or individual (although scientists such as Heisenberg have pointed out that a science isolated from the scientist is impossible). Current psychology and philosophy are also eager to ally themselves with scientific approaches, varying from the efforts of behavioristic psychology to find postulates and theorems of behavior, to analytic or positivistic philosophy, which feels its niche is attempting to clarify scientific concepts and meanings. The most absurd result to date would appear to be the search for a "scientific theology." The fact of individual existence, with a persistent emphasis on the self rather than on abstractions about mass man in a depersonalized society, is the concern of existentialists, and to this extent existential thinking may be described as unscientific. Its concern is more for the reality underlying each individual's adjustments and "crises," and the man who is

experiencing them, rather than with classifying his isolated experiences.

Barrett has historically analyzed the Hellenic search for science and other knowledge and the Hebraic moral search made by the individual, which in Western civilization was the beginning of the reflection on individual guilt, anxiety and responsibility (3). At the end of antiquity the Stoics pondered such problems as the meaning of existence and the conflicts between reason (in the sense of objective argument) and man's fears and anxieties. They realized that one could not argue anxiety away, nor was anxiety merely over death itself, as man clearly was not so much afraid of death as of the suffering before death. The Stoics believed that one could conquer such anxiety by affirming one's identity, in spite of fate and death, with a transcendent participation in the universal Logos. They believed the human mind was capable of this. During the Christian Middle Ages writers such as Tertullian and St. Augustine are now mentioned as examples of men who emphasized existential religious experiences. By the 13th century the issue had been joined between St. Thomas Aquinas, emphasizing the intellect's supremacy, and Duns Scotus, who stressed the primacy of the will. This split is not yet healed, even in Catholic philosophy, Dominicans still adhering to Thomism and Jesuits retaining Scotism (12). From an existential point of view the question is whether the thinker or his thoughts are given primacy, and it is not often discussed in terms of Scholastic philosophy. Pascal was a 17th century philosopher who was preoccupied with anxiety; moreover, he was a scientist and an existentialist in every modern sense of the word. In his *Pensées* Pascal voices his fright at being "engulfed in the infinite" and expresses the existential predicament of not knowing "why I should be here rather than there, now rather than then" (32). He noted as a form of anxiety the attempts of people to continuously occupy themselves and recognized the failure of reason to master the emotions. Spinoza also teetered on the brink of the problem in his analysis of fear and hope, but his confidence in a rationalistic method as a definitive answer to problems of existence allowed him to stay on that plane of explanation, despite the anxiety which he himself had experienced.

The next important figure is Kierkegaard, whose interest in anxiety became an obsession, in the opinion of many. A large number of his insights have still not been surpassed in profundity despite his lack of modern psychological tools. Kierkegaard's thinking developed in the period of reaction against the subjugation of man by mechanization, when other philosophical and sociological writers—such as Schelling, Engels, and Schopenhauer—were pleading a return to man's immediate experience. Only this, they insisted, conferred true objectivity and not a rationalistic system whose objectivity was spurious (37). One of the most striking aspects of Kierkegaard's writing is his fragmentation, his tendency to view things in the particular, concrete human situation in which man lives. He could not consider man in the abstract, since such a being could not exist for consideration in terms of the individual as subject-plus-object. He felt that anxiety originated in unlimited freedom's becoming aware, through conscience, that some limits must be set; anxiety is experienced in setting the proper borderline for actions and prohibitions. When one realizes that he is free to transgress the prohibitions, he becomes anxious, and makes the theological discovery of sin due to rebelliousness. These subjective states of anxiety and sin regarded by Kierkegaard as basic to human existence. Kierkegaard thus provides for a complete psychology of conflict and motivation. He speaks of normal anxiety, which contributes toward self-realization in a given context, and of one's over-all self-awareness (23). From this self-awareness arises the classic predicament, to change or to refuse to change; either will produce anxiety and

concomitant guilt. Kierkegaard was aware of the painful aspects of anxiety, yet felt it was impossible to avoid "commitment" and to try was to avoid a chance for "becoming educated" (22). It is thus not a distortion to say that for Kierkegaard the rule of life would have been to seek anxiety, since only by using it can one truly realize his freedom.

A succession of existential contributors to the problem of anxiety followed Kierkegaard. Nietzsche pursued the theme of the truth that lies behind pure reason by inquiry into the unconscious and the irrational. He did not seem as pessimistic about the problems of anxiety, failure and death as other existential writers have been, and his overall influence has contributed immeasurably to existential thought. His concept of the "will to power" was believed to be an integral part of living whereby one could achieve self-realization, not only over empirical anxiety, but over ontological disquiet. Much of his writing also foreshadowed Freudian defense mechanisms and attempts to describe oneself and others. Nietzsche considered altruism and morality as being due to repressed hostility (inward aggression), which may break out in sadistic acts clothed with the title of morality, or take the form of superficial tranquility beneath which the anxiety is all too apparent (29). Karl Jaspers, originally a psychiatrist who wrote a textbook on *General Psychopathology*, is now a philosopher with a skeptical appraisal of how much any psychological work, including his own, has accomplished, for "its yield for the knowledge of psychic life remains small after all" (21). Jaspers is not antirational, but for him philosophy and knowledge begin when reason has been exhausted. In the preface to his textbook Jaspers refers to life as having meaning only for those who experience it as a personal, irrational responsibility from which there is no release. The creativeness resulting from an illness, such as schizophrenia or depression, is due to the accompanying ultimate despair which an individual would not otherwise have experienced. Jaspers consistently opposed Freud, "not as a person (whom he respected as an independent, free personality); nor as a scholar (whose intuitive insights he has evaluated with justice)—but as a philosopher who created a theory which degrades man" (24). Jaspers has also criticized psychoanalysis for claiming a total knowledge of man, and for confusing *meaning* (*sinnverstehen*) with *causal* explanation.

Heidegger is another existentialist writer who has something to say about anxiety from an ontological viewpoint. Heidegger's position differs from Jaspers'; his account of man and anxiety is very abstract and obscure, and will only be mentioned here without exegesis; it reminds one of the type of thinking which relies on word and thought omnipotence. The Heideggerian man is related not only to himself (a being) but to actual Being, by which he means the to-be of whatever is (3, p. 210). One's Being is not an introspective self realizing he exists, like Descartes', but acquires meaning in a field or region. This field of being is *dasein*, meaning being-there, and man thus has meaning as a field. These concepts take meaning in relation to his discussion of anxiety, as he holds this state to be where life is felt as its most extreme. Although Heidegger analyzes in philosophical terms, his thinking has psychological implications. In his discussion of man's most extreme realization of his finitude, when he confronts the fact that he can and will die, his Being is penetrated by non-Being and he becomes anxious. Anxiety is overwhelming because it is being afraid where the object of fear is Nothingness, which is always present and inseparable from Being.

Many thinkers who have contributed to existentialism or been influenced by it, cannot be dealt with here; these would include Sartre, Camus, Bergson, Marcel, Rilke, Kafka, Berdyaev, Unamuno, Ortega, Buber, Bultmann, and others. It would be possible to take each of these writers and

attempt to dissect their position regarding anxiety, but perhaps the above selection will provide an adequate representation of the main philosophical background of current existential psychoanalysis.

IV

The influence of philosophy on the existential analytic group is quite clear. It is, first, important to distinguish between *existential psychotherapy*, which applies some of the existential concepts to treatment, and *existential analysis* (*Daseinsanalyse*) which draws on psychoanalysis, phenomenology and existential thought. The earliest existential approach was the phenomenological phase deriving from Edmund Husserl's attempt to describe acts and contents of consciousness just as they were experienced without theoretical assumptions. From his philosophical phenomenology people like Jaspers, Minkowski, Strauss and von Gebsattel developed psychiatric phenomenology. Existential analysis came into being later, with Binswanger's attempt to synthesize Freudian and Heideggerian concepts. The friendship between Freud and Binswanger was striking, in view of their great intellectual divergences. In some of his early writings Binswanger stressed the importance of empathic understanding; later he questioned whether an empirical science could be based on something so basically subjective and personal (34). He went on to state that empathic understanding by immediate experience was more helpful in analysis than in rational interpretation. Binswanger's later work has come under the heavy influence of Heidegger, especially in his attempted definition of existence as "the new conception that man is no longer understood in terms of some theory—be it a mechanistic, a biologic or a phenomenologic one—but in terms of a purely phenomenologic elucidation of the total articulation of existence as 'being in the world' " (4). The central concept of existential analysis and its interpretation of anxiety for Binswanger is "Being in the world," which has different experiential models: there is thus Being at hand, referring to the environment of things; Being with others, regarding the experience with other people, Being in itself, which is experiencing the Self; and Being beyond itself, which encompasses the feelings of love. The world is thus not merely a place where one exists, but rather it simultaneously determines the how and why of one's being. There is a steady reciprocity between the worldly situation and the worldless subject, neither of which would have meaning in an isolated state. It would thus be impossible to view anxiety as merely occurring in a lone individual; the conclusion must be that the world cannot be considered as a dichotomy of "objective stimuli" and "objective responses" to sensations, but must be viewed as a reciprocal process where "being in the world" means that we are what we are experiencing the world to be. This implies a space-time orientation where *here* means "my here" and *now* means "my now" (5).

These concepts have led to a formulation of anxiety by the existential analysts. No attempt will be made to give specific credit to different contributors (their names can be found in May's book on *Existence* (29) from which much of the following material is derived). Existential analysts stress that anxiety is explained ontologically. It is in their view not merely something to be classified with affects, as pain and pleasure are, but is simultaneously an awareness of one's potential non-being, and the very means by which such non-being could come about. Facing the fact that one can become "nothing" is in itself an encroachment on one's being by "nothingness." Anxiety is thus not something we get or acquire, but something we are. The crucial difference between anxiety and fear is that the former is ontological while the latter is not, since it is oriented towards a definite object. Anxiety penetrates to the core of one's experience as a being by depreciating one's self-esteem and value, whereas fear may be considered

an affect and an objective threat to something not nearly so crucial. The greatest threat man can suffer is to his existence; this threat is accompanied by an unmatched anguish. Anxiety results, too, from the conflict between capitalizing on one's opportunities, thus affirming oneself, and bypassing self-fulfillment by hesitating to risk one's meager security. This formulation is strikingly similar to Kierkegaard's concept of freedom, with its mystical connotations. Freud reacted against this mysticism, and against the legalistic morality which emphasized essence above existence; consequently, his secular approach insists that man can achieve self-realization independently of ordained formalities.

An alternative existential approach to anxiety is to view experiences categorically around the co-ordinates of time, space and causality (7). Time, for instance, is noted to have characteristics such as flowing, viewed from the past, present, and future, and moving at a certain rate which may be distorted to different degrees by different people. In states of anxiety time seems to move much more slowly, so that we cannot understand the meaning of life apart from our categorized feelings of time. Distortions in this category have effects that may pervade all aspects of our life; extreme examples would be a depression where the experience is that of time flowing very slowly if not actually arrested, or a manic state, where time seems to be increasing at an accelerated rate. Similar analyses and examples with their accompanying distortions could be made from the categories of space and causality.

Limitations of space allow only a comment about the wide ethical possibilities that can be drawn from such reasoning. Loneliness may be considered as a special form of anxiety (possibly related to separation anxiety) where the awareness of separation is held to be the most painful conscious experience one can have. It has further been observed that anxiety in children is usually accompanied by a somatic symptom; some have interpreted this to mean that the child experiences the anxiety-inducing situation as a menace to his existence. Others have focused on the pressure to conform progressively, put on the individual, as the primary factor in obliterating his individuality and sense of personal accomplishment, and in accentuating his eternal loneliness and his problem of identity (38). The implication here is that the firmer yet more flexible one's values (if this is not incompatible), the more he will be able to master anxiety constructively and maintain his own individuality (28).

Some appraisal of these existential views on anxiety must be offered. Clearly they have not been met with full acclaim, and for various reasons—the opposition to speculative, mystical trends in the pragmatic optimism of the United States being prominent among them. Instead of inquiring why they have not been more readily accepted, the logical validity of the existential views should first be considered. 1) These formulations appear to view the problem of anxiety, as we see it today, as something new. It is emphasized that the cultural stresses of today produce more neuroses than before. An alternative view would be to think of anxiety as a common intrapsychic denominator, different neuroses merely dominating different historical periods; anxiety, possibly, is the most common manifestation of this era. 2) Again, many of the objections to Freudian views on anxiety seem to imply that only the existentialists are truly concerned with the individual. On the other hand it can be maintained that Freud himself, perhaps more than any other, put the individual at the center of all treatment, and to the extent of seeming to ignore "cultural factors." At times it appears that existential psychology itself has become too sweeping and transcendental in its concepts of anxiety, without sufficient emphasis on the specific components of anxiety, such as the defense mechanisms. Existential-

ists stress that their views on anxiety are based on immediate experience in the confrontation with the possibility of non-being. Since this sense of immediacy is the setting in which man experiences anxiety, it might be more profitable to first attempt scientific, *i.e.* causal, explanations, by demonstrating the connection one's symptoms may have with unconscious conflicts, and then to move to philosophical implications. 3) From a semantic point of view it is doubtful if the existential approach to anxiety achieves any improvement in clarity, not only from a psychological but from a metapsychological analysis. One can also be critical of the introduction of new terminology in an area already overburdened with terms that make communication difficult. In dealing with the conceptual framework that is offered by existential writers, one can ask if there has been an improvement by the use of such expressions as, "to experience oneself as part of the larger Being," to "transcend the present anxiety," and "anxiety before Nothingness" (4). One can legitimately inquire about the meaning of such terms as these; for some they appear to be little better than meaningless phrases set in a dialectic framework. 4) Many of the existential writers seem to hold the notion of an unconscious that is incompatible with their views of anxiety. They seem to assert that Freudian psychoanalysis postulates the existence of an unconscious not accessible to the intuition of the person. This is misrepresentation or misunderstanding: to Freud the unconscious was accessible, but indirectly—in slips of the tongue, for example—and constant vigilance was needed to keep unconscious material from consciousness. 5) There appears to be a logical error in the work of many existential writers: they often begin with an analysis of their own anxiety, which they all emphasize, yet they want their conclusions to apply to every existence. Notwithstanding their clinical efforts, this kind of unjustified generalization is implicit in at least some of their work. Man is thus not in cosmic existential predicaments but in specific predicaments where the existential rhetoric is of no avail (30). 6) It must, finally, be observed that existential thinking has had few, if any, original contributions to the problem of anxiety that were not at least implicit in Freud's writings. Freud may well have had the elements for an existential solution to the anxiety problem—particularly in his analysis of narcissism and relating oneself to reality—which needed only to be put into an ontological framework to attain a close equivalent of the contribution of present-day existential analysis. Thus, although Freud discussed the conflict between narcissism and the reality principle in terms of infantile libido, narcissism may also be viewed as a way of relating oneself to the world; the reality that imposes itself is not a specific privation but a categorical privation—"imposed by the very structure of Existence itself—space, time and causality" (36). Other situations provoking anxiety *e.g.*, maternal separation, similarly threaten annihilation ("nothingness"), and mastery is a triumph of existence over essence.

V

In this paper an attempt has been made to provide an outline of Freudian concepts about the origin of anxiety, with some of the alterations by his successors, and a brief consideration of the contributions of some transitional groups. Some background of existential discussions of the problem of anxiety was followed by a discussion of the current meaning of existential psychoanalytic concepts of anxiety. A criticism of the existential ontological or ultimate views on anxiety was then made.

It is difficult at this point to evaluate what contributions existential writings on anxiety will ultimately make. If one is inclined to a type of deterministic psychological explanation, the existential approach could be assumed to have arisen from a genuine need at this period. Its frequent stress on the individual cannot be viewed

askance. In this regard existential analysis certainly runs contrary to the American emphasis on a positivistic and statistical approach to such behavior as anxiety. It is this author's opinion that both types of analytic concepts of anxiety discussed in this paper stand as a reaction to attempts at forcing man's behavior into a Procrustean bed of description, as a non-personalistic science does. These concepts appear to stand against the historical forces which some fear will inevitably eliminate a concern for the individual, and against the philosophical background which has culminated in a psychology commonly referred to as one that first lost its soul, later its consciousness, and finally its mind altogether.

REFERENCES

1. Adler, A. *Problems of Neurosis*. Cosmopolitan Book Corp., New York, 1930.
2. Bakan, D. *Sigmund Freud and the Tradition of Jewish Mysticism*. Van Nostrand, Princeton, N. J., 1958.
3. Barrett, W. *Irrational Man: A Study in Existential Philosophy*. Doubleday, New York, 1958.
4. Binswanger, L. Existential analysis and psychotherapy. Progr. Psychother., **1**: 144–148, 1956.
5. Blauner, J. Existential analysis: L. Binswanger's Daseinsanalyse. Psychoanal. Rev., **44**: 51–64, 1957.
6. Cannon, W. B. *The Wisdom of the Body*. Norton, New York, 1932.
7. Ellenberger, H. F. Phenomenology and existential analysis. Canad. Psychiat. Ass. J., **2**: 137–146, 1957.
8. Eysenck, H. J. *The Dynamics of Anxiety and Hysteria*. F. A. Praeger, New York, 1957.
9. Fenichel, O. Early mental development; the archaic ego. In *Psychoanalytic Theory of the Neuroses*, p. 33–53. Norton, New York, 1945.
10. Freud, S. *New Introductory Lectures in Psychoanalysis*. Norton, New York, 1933.
11. Freud, S. *The Problem of Anxiety*. Norton, New York, 1936.
12. Gilson, E. *Being and Some Philosophers*. Pontificial Institute of Medieval Studies, Toronto, 1949.
13. Goldstein, K. Abstract of a panel discussion in which he participated on neurotic anxiety. Amer. J. Psychoanal., **12**: 89, 1952.
14. Goldstein, K. *The Organism*. Amer. Book., New York, 1939.
15. Harper, R. A. *Psychoanalysis and Psychotherapy: 36 Systems*. Prentice-Hall, New Jersey, 1959.
16. Hartmann, H. *Ego Psychology and the Problem of Adaptation*. International Universities Press, New York, 1958.
17. Herberg, W. *Four Existentialist Theologians*. Doubleday, New York, 1958.
18. Horney, K. *Neurosis and Human Growth*. Norton, New York, 1950.
19. Horney, K. *New Ways in Psychoanalysis*. Norton, New York, 1939.
20. Kardiner, A., Karush, A. and Ovesey, L. Methodological study of Freudian theory: IV. The structural hypothesis, the problem of anxiety, and post-Freudian ego psychology. J. Nerv. Ment. Dis., **129**: 341–456, 1959.
21. Kaufman, W. *Existentialism from Dostoevsky to Sartre*. Meridan Books, New York, 1956.
22. Kierkegaard, S. *The Concept of Dread*. Princeton Univ. Press, Princeton, New Jersey, 1944.
23. Kierkegaard, S. *Sickness Unto Death*, p. 141–278. Doubleday, New York, 1954.
24. Kolle, K. Jaspers as psychopathologist. In *The Philosophy of Karl Jaspers*, Schilpp, P. A., ed., p. 437–466. Tudor, New York, 1957.
25. Kris, E. Ego development and the comic. Int. J. Psychoanal., **19**: 77–90, 1938.
26. Kubie, L. A physiological approach to the concept of anxiety. Psychosom. Med., **3**: 263–276, 1941.
27. McLean, P. G. Psychiatry and philosophy. In *American Handbook of Psychiatry*, Arieti, S., ed., p. 1760–1776. Basic Books, New York, 1959.
28. May, R. Anxiety and values. Progr. Psychother., **2**: 82–97, 1957.
29. May, R., ed. *Existence*. Basic Books, New York, 1958.
30. May, R. *The Meaning of Anxiety*. Ronald Press, New York, 1950.
31. Mowrer, O. H. *Learning Theory and Personality Dynamics*. Ronald Press, New York, 1950.
32. Pascal, B. *Pensées*. Routledge & Paul, London, 1950.
33. Rank, O. *Will Therapy and Truth and Reality*. Knopf, New York, 1947.
34. Schmidl, F. Sigmund Freud and Ludwig Binswanger. Psychoanal. Quart., **28**: 40–59, 1959.
35. Sullivan, H. S. *Interpersonal Theory of Psychiatry*. Norton, New York, 1953.
36. Tiebout, H. M., Jr. Freud and existentialism. J. Nerv. Ment. Dis., **126**: 341–352, 1958.
37. Tillich, P. Existential philosophy. J. Hist. Ideas, **5**: 44–70, 1944.
38. Wheelis, A. *The Quest for Identity*. Norton, New York, 1958.

PSYCHOLOGICAL TESTING IN CLINICAL NEUROLOGY

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INTRODUCTION

Few neurologists today would consider that psychological assessment constitutes an important part of the investigation of a patient with suspected brain damage. For instance, intellectual impairment does not appear among the signs discussed in a recent analysis of cases of epilepsy of late onset by Raynor *et al.* (20). On the face of it, this fact may appear a little surprising, since it is now generally accepted that the brain is the organ of the mind. However, neurologists would, with some justification, reply that psychologists have not been able to provide data which are of value in the problem of diagnosis. This state of affairs has arisen for a number of reasons, the foremost of which is undoubtedly the lack of agreement among psychologists themselves about which tests to use and how to present the data to the clinician; and this in turn arises from the various theoretical inclinations of individual psychologists.

On the one hand, there are those who take the view that, from the point of view of intellectual activity, the brain is an homogeneous organ, and that a lesion in any part of the cerebrum results in the same kind of impairment. For Goldstein and his followers, disturbance in language and in non-language performances "are simply the effect of the same dedifferentiation of brain function in two performance fields" (6). Other investigators have been mainly influenced by Lashley's early work (11), in which he demonstrated that the degree of impairment of maze-learning in rats was related to the extent of cortical surface ablated, rather than to the locus of damage. Perhaps the largest number in this group are those workers who seek a test of "brain damage," or who compare the test results of controls with those of a group of patients with evidence of cerebral disorder regardless of its pathology or locus. Although a number of these have disclaimed adherence to any particular theory, they must, as Meyer (16) has pointed out, nevertheless, be grouped with the "unitary function" supporters, since the idea that the effect of any kind of cerebral lesion can be represented by a single measure or test implies this assumption. Many of these, besides overlooking the neurological evidence for the localization of cerebral functions, have used arbitrary tests or ratios between test scores, without any hypothesis as to their possible relation to cerebral function. There have been many reviews of the numerous papers in this field (10, 16, 31), but the general impression created is that none have demonstrated the diagnostic value of this kind of testing.

Other authors have accepted that cerebral function may be capable of subdivision, and have investigated in some detail the effects of lesions in different areas. Perhaps outstanding among these, from a psychologist's point of view, are Rylander's work on the frontal lobes (23), the studies of Zangwill and his co-workers on visual-constructive disabilities with parietal lesions (14, 15), and Milner's work with temporal lobe ablations (17). Other studies have been concerned with a deficit or group of deficits, and their

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relationship to lesions in different locations; *e.g.* the work of Weisenburg and McBride with aphasia (30), and Teuber and his co-workers with a variety of cognitive and perceptual tasks (25, 29). Although these studies have generally been more fruitful in their contribution to understanding of cerebral organization than those of the "unitary" school, their relevance to diagnostic procedure is not unequivocal: indeed, many of the authors would disclaim such intentions. The chief obstacles to their acceptance as aids to diagnosis are, as Meyer (16) has pointed out, the fact that generally the cases were selected to emphasize the disability being studied; that often there was no comparison with a control group; and that, granted the relationship of the disability to the site of lesion, there is no reliable way of contrasting this with the functions related to other (intact) areas or with the capacity of the patient before the injury.

In the face of these difficulties some psychologists have more or less abandoned hope, or at any rate abandoned the use of more than a few tests as a medium of communication with the patient rather than out of interest in the score achieved. Thus Yates' (31) analysis of tests of brain damage is entirely pessimistic, and offers no alternative suggestion to the clinician; while Piercy (19), though rejecting Yates' nihilism, emphasizes the importance of experience, rather than quantitative data, as a basis for clinical judgement. Some psychologists use one or two unscored, unstandardized tests, such as learning Babcock's sentence (Zangwill (32)); while others reject all except the few tests shown to have a high level of reliability, and attempt a general assessment of the patient's functioning level in his environment.

In short, there appears to be little evidence which a psychologist can offer to a neurologist to assist him in his problem of diagnosis. However, this conclusion appears to the author to be the consequence of mutual misunderstanding, and particularly of the psychologist's ignorance of neurological facts. Neurologists have, in the last century, added disorders of language, calculation, perception and execution to the signs of local cerebral injury; but few psychologists have proceeded from this core of knowledge to examine the possibility that disturbances of higher aspects of these functions, manifested on psychological tests, may be similarly related to localized lesions. It is the purpose of this paper to demonstrate that such relationships may frequently be found, and to consider their implication in clinical practice.

RESULTS OF PSYCHOLOGICAL TESTING

The first psychologist at this hospital took up the appointment in 1947. Since then, over 4,000 patients have been referred for testing, the majority with requests for identification or exclusion of organic intellectual impairment. Among the dozen or so individuals who have worked in this department, almost every point of view has been represented, from those who would give the full Wechsler Intelligence and Memory scales, with other tests or procedures if indicated, through those who gave only the subtests which they considered relevant, to those whose approach was essentially qualitative. Scrutinizing this material, therefore, provides an opportunity for analyzing results on a considerable variety of tests, of larger groups than is usual in experimental studies. Inevitably, there are some patients in every diagnostic category for whom test data are not available; but this is offset by the relatively large numbers in each group and can further be minimized by the method of analysis adopted.

LOCALIZED LESIONS

For present purposes, the records have been examined of *all* those of the first 4,000 patients, over twenty years of age, who were ultimately found to have localized cerebral lesions, but excluding cases of injury at birth or in early childhood. In addition to neurological signs, it was a requirement that

TABLE 1

Localized Lesions in 4,000 Referrals

Lesion	Left			Right		
	Frontal	Temporal	Parietal	Frontal	Temporal	Parietal
Intracranial tumors	40	27	51	37	26	34
Vascular accidents	0	5	7	0	0	14
Atrophy	0	5	1	2	2	2
Excisions	4	4	0	8	5	0
Lacerations	2	0	7	1	3	2
Gross totals	46	41	66	48	36	52
Rejected	5	10	25	6	11	17
Net totals	41	31	41	42	25	35

the localization should have been confirmed at least by pneumo-encephalography or arteriography, if not by inspection at operation or at autopsy. Cases of atrophy and vascular accident were similarly included only if clearly restricted and localized—the atrophy by pneumo-encephalogram and the vascular lesion by arteriogram or direct inspection. The numbers in each diagnostic category are presented in Table 1, and further subdivided into the location, according to the conventional subdivision into lobes, of the greater part of the lesion. From the totals of these are subtracted the numbers of patients who, for some reason or other (usually because of severe degree of impairment) did not do more than three of the tests under consideration. Within these limitations, the sample approximates an unselected one.

WECHSLER SCALE TESTS

In analyzing the results on standardized tests the problem arises of how best to use the data. In an earlier paper on the same subject, McFie and Piercy (13) analyzed deviations, corrected for age, from each patient's estimated "premorbid" level. This procedure entailed a number of arithmetical steps, meant selection of patients who had done a useful number of tests, and concluded with the rather unsatisfactory method of repeated "*t*" tests. It also involved the theoretical assumption that Wechsler's (27) "Hold" tests were not sensitive to localized lesions. In the present study, no other manipulation is involved than computing the difference between each patient's score and the mean of a normal population at his age (Wechsler (29), p. 222, and Fox and Birren (5)): when the W.A.I.S. had been used, the difference between the age-corrected score and the presumed mean of 10 was used. This involves no assumptions about relative sensitivity to cerebral lesions; and one-way analysis of variance of results with each test eliminates dependence on comparison with "Hold" tests. Table 2 presents the mean differences on subtests on the Wechsler scales of each group of patients, and the level of significance of the variance ratio (F) for each of the subtest columns. In view of the relatively large number of F and chi-square tests done, significance is not considered to be established unless the value of the statistic corresponds to the one per cent level.

TABLE 2

Mean Differences on Wechsler Subtests From Normal Age-Scaled Means

Site of Lesion	Vocab.	Dig.Sp.	Simils.	Arith.	Blocks	P.Arr.	P.Co.	Dig.Sy.
Left Frontal	1.9	−2.1	0.9	0.5	1.3	0.0	3.3	−1.4
Left Temporal	0.7	−1.3	−2.7	0.4	1.1	0.4	1.9	−1.1
Left Parietal	1.7	−2.5	−0.9	−3.5	−1.3	−0.5	1.3	−2.7
Right Frontal	2.6	0.2	1.8	1.5	0.2	−1.4	2.6	−2.4
Right Temporal	1.5	1.2	2.6	2.0	0.6	−2.7	2.9	−2.1
Right Parietal	2.0	0.1	2.5	−0.4	−2.8	−1.2	1.3	−1.8
Total N	206	176	201	182	209	131	143	101
Significance of F: p =	<0.02	<0.001	<0.001	<0.001	<0.001	<0.01	<0.05	<0.10

The adequacy of the correction for age, implied by using the age-scaled mean as a reference point, was examined by comparing the mean scores of patients above and below 45 years. On no subtest did the difference reach the five per cent level of significance, indicating that the correction for age was probably satisfactory. Inspection of Table 2 shows that in many groups (*e.g.* Vocabulary, Picture Completion) the mean score is some 2 or more points above the normal mean, while in others (*e.g.* Picture Arrangement) the highest scores are in the region of O. This may be due to cultural influences (*cf.* Robertson *et al.* (22)), but probably also reflects a selection in the social level of patients referred for specialized investigation. It does not, however, affect the significance of the comparisons made.

In considering the scores on verbal tests, it must be emphasized that only 36 of the 113 patients with left hemisphere lesions showed any clinical evidence of dysphasia, and in none was it so severe as to impair comprehension of the questions or the ability to answer them. Only on the Similarities test was there a suggestion that deficit was associated with evidence of receptive dysphasia. No patient was dyscalculic; and only 12 of the 76 patients in the parietal groups showed clinical evidence of visual-constructive disability.

UNSTANDARDIZED TESTS

With the remaining tests, the question of how to deal with the data is less complicated, and the majority of results can be recorded simply as "pass" or "fail." These are presented in Table 3. An exception is Sentence Learning, which is analyzed under two headings: 1) the mean number of repetitions taken to learn the "Babcock" sentence to two consecutive correct repetitions; and 2) the numbers passing and failing (failure consisting of requiring more than five repetitions to learn). With learning digits, failure was defined as requiring more than three repetitions to learn a series of digits one longer than the immediate span (*i.e.* in the Digit Span test, repeating the second series of digits failed). Our criteria for passing Weigl's sorting test have been given elsewhere (McFie and Piercy (12)). They have been criticized by Critchley (4) for not stating any time limit, but experience with the test will make it clear that this is impracticable: no time limit was suggested by Weigl (28). Under the heading Series Recall is given the mean number of "stories" recalled by the patient immediately after completing the Picture Arrangement test: in brackets after these figures are the number of patients who, spontaneously or to suggestion, confabulated, having arranged pictures about "a man without a shadow,

TABLE 3

*Unstandardized Tests: Results According to Location of Lesion**

Site of Lesion	Learning			Weigl's Sorting	Series Recall (Items)	Estimation of Time	Memory for Designs
	Sentence (repetitions)	Sentence	Digits				
		P F	P F	P F		P F	P F
Left Frontal	6.2	12 17	11 10	25 7	3.7 (0)	9 5	23 6
Left Temporal	7.2	7 16	7 12	18 4	3.7 (1)	14 1	17 5
Left Parietal	5.9	10 13	14 14	22 12	3.6 (4)	3 2	13 8
Right Frontal	5.2	18 9	13 12	29 1	3.3 (3)	6 7	18 18
Right Temporal	3.9	10 3	5 0	10 1	4.0 (0)	3 1	8 9
Right Parietal	4.5	16 5	7 3	18 2	3.2 (0)	2 3	3 20
Level of Significance	(F)	$\chi^2 = 16.6$	None	$\chi^2 = 12.9$		χ^2 (L. vs R.) = 3.1	$\chi^2 = 28.9$
	$p < 0.001$	$p < 0.01$		$p < 0.05$	None	$p < 0.10$	$p < 0.001$

* Unless stated otherwise, χ^2 is given for a 6-by-2 table.

TABLE 4

Tests Impaired by Lesions in Different Locations

Site of Lesion	Tests showing greatest impairment
Left Frontal	Digit Span; Sentence Learning.
Left Temporal	Similarities; Digit Span; Sentence Learning.
Left Parietal	Arithmetic; Digit Span; Block Designs; Sentence Learning; (Weigl's sorting).
Right Frontal	Picture Arrangement; Memory for Designs.
Right Temporal	Picture Arrangement; Memory for Designs.
Right Parietal	Block Designs; Picture Arrangement; Memory for Designs.

walking towards the sun" (the last picture in Picture Completion, which was given immediately before Picture Arrangement). Estimation of Time is, like Series Recall, a test completed by only about one-quarter of the patients: at the end of the first test session (usually one to one and one-half hours) the patient was asked to estimate its duration, and an estimation of one half or less of the actual time constitutes failure. Memory for Designs is the Terman-Merrill (26) Form L, item IX, 4; with the difference that the examiner himself drew the designs, and allowed the patient to study them for as long as he wished before removing them.

CONSISTENCY AND CEREBRAL DOMINANCE

One hundred and sixty-seven of the patients did seven or more of the tests (apart from Series Recall and Time Estimation) and each record was scrutinized in the light of the foregoing data, to ascertain whether or not it showed the same pattern of deficits as the location group within which it was placed. The criterion of consistency adopted was that the patient's lowest scores (corrected for age) should be on those subtests which in Table 2 show a mean difference of less than -1.0 to be associated with a significant value of F: the relevant tests are indicated in Table 4. The results of this analysis are shown in Table 5: in the "inconsistent" column are the numbers of those whose pattern of deficits was not similar to that of the group; and in the third column are the numbers of those whose results showed little or no evidence of impairment (*i.e.* little variation in subtest scores, and good performance on learning tests).

TABLE 5

Consistency of Individual Results with Patterns of Groups

Site of Lesion	Impairment consistent	Impairment inconsistent	Little impairment
Left Frontal	18	6 (2)	6
Left Temporal	16	10 (2)	0
Left Parietal	27	6 (0)	2
Right Frontal	15	6 (4)	1
Right Temporal	15	5 (2)	0
Right Parietal	24	9 (4)	1
Total	115	42	10

In the "inconsistent" column of Table 5, the figures in brackets refer to the numbers of records in which not only were the lowest scores not on those subtests appropriate to the group, but they were on subtests which showed significant impairment in the *contralateral* group (*e.g.*, a Right Frontal patient showing greatest impairment in Digit Span and Sentence Learning). Only one of these (a patient with a right temporal abscess) showed a mild degree of dysphasia. Furthermore, it will be seen that while only four of the twenty-two "inconsistent" records with left sided lesions showed this anomaly, it was found in ten of the twenty with right sided lesions. With a chi-square value of 3.45, this almost reaches the .05 level of significance, and may be regarded as suggestive.

Nine of the 167 patients were left-handed or had shown a tendency to use the left hand for conventionally right-handed operations; but none of these showed the kind of

inconsistency referred to in the previous paragraph. Of the five with right-sided lesions, all showed "consistent" patterns of impairment; and of the four with left-sided lesions two showed "consistent" impairment, one showed little impairment, and one (a patient with a left frontal astrocytoma) showed impairment which was "inconsistent," but more like the Left Parietal group.

CEREBRAL ATROPHY

WECHSLER SCALE TESTS

From the same population of 4,000 patients referred for testing, 62 were found who had done all the eight subtests of the Bellevue scale referred to in the previous section, and who had been examined by pneumoencephalography. They were included in a survey by the Department of Neuroradiology, designed to examine the assertion of Bruijn (2) that the cross-measurement of the *cella media* (the combined width of the bodies of both lateral ventricles) is a valid estimate of cerebral atrophy: in consequence, this measure was available for each patient, together with a statement as to whether there was asymmetry between the two lateral ventricles, or localized dilatation or pooling of air over the cortex. Because of asymmetry, or localized accumulations of air, 11 patients were excluded from the series, leaving 51 for the final analysis. The relevant data are given in Table 6, together with coefficients of correlation between ventricular measurement, age, equivalent weighted test scores and Deterioration Loss (calculated using Vocabulary and Picture Completion alone as "Hold" tests). Correlations have been calculated both for the "raw" Deterioration Loss, and for the Deterioration Loss after subtraction of the appropriate allowance for each patient's age (Wechsler (29), p. 66; Fox and Birren (5)).

TABLE 6

Cross-Measurements of Lateral Ventricles and Ages of 51 Patients, and Correlation Coefficients of These Values with Test Scores

	Ventricular Width	Age
	Range: 27–62 mm. Mean: 44.9 mm. S.D.: 6.5 mm	16–68 years 46.4 years 14.7 years
	Correlations	
Age	−0.07	—
Digit Span	−0.02	−0.19
Arithmetic	−0.02	0.09
Similarities	0.07	−0.11
Vocabulary	0.28*	0.15
Picture Completion	0.07	−0.19
Picture Arrangement	0.02	−0.27*
Block Design	−0.03	−0.26
Digit Symbol	−0.19	−0.34†
Full scale I.Q.	−0.02	0.29*
Deterioration Loss (1)	0.33†	0.24*
Deterioration Loss (2)	0.39‡	−0.30†

* $p < .05$
† $p < .02$
‡ $p < .01$

Deterioration Loss (1): Wechsler's Deterioration Loss uncorrected for age.

Deterioration Loss (2): Wechsler's Deterioration Loss corrected for age.

It will be noted that there is a highly significant correlation of the measurement of ventricular width with the age-corrected Deterioration Loss; and also a significant correlation with the uncorrected Deterioration Loss. However, while there is a positive correlation of patient's age with Deterioration Loss, there is a significant negative correlation between age and age-corrected Deterioration Loss, suggesting that the corrections for age are in fact too great: ideally, the latter correlation should not be significantly different from zero. Since both the measure of ventricular width and the Deterioration Loss are only tentative estimates of organic loss, validity of prediction of one from the other cannot be expected to be as high as the consistency of pattern of deficit with locus of lesion. Dividing the 51 patients into two groups, with ventricular measurements above and below the overall mean of 44.9 mm., 22 of the 30 in the group with the larger ventricles had age-corrected Deterioration Losses above 10 per cent; while 15 of the 21 in the remaining group

had Deterioration Losses of 10 per cent or less.

OTHER TESTS

Using the same subdivision of the 51 patients into those with above and below mean ventricular measurements, the scores, or numbers passing and failing, on the unstandardized tests are given in Table 7. It will be observed that none of these tests show significant differences between the two groups.

TABLE 7

Results on Unstandardized Tests of Patients with Cross-Measurements of Lateral Ventricles Above and Below Mean (44.9 mm.)

Test	Ventricular Width			
	44 mm. and below		45 mm. and above	
	Passed	Failed	Passed	Failed
Weigl's Sorting	11	3	16	5
Digit Learning	6	5	11	10
Sentence Learning	8	3	7	7
Time Estimation	5	4	7	9
Series Recall	Mean 3.7 Number tested 8		Mean 3.4 Number tested 16	

DISCUSSION

THEORETICAL IMPLICATIONS

The results of this series generally confirm the conclusions reached in an earlier study by McFie and Piercy (13). In spite of the arbitrary localization of the lesions in terms of the conventional anatomical divisions, and in spite of individual variability in cerebral organization, a general picture emerges of intellectual impairment occurring with lesions in areas associated with clinical disorders such as aphasia, apraxia, etc., but restricted to what Rylander has called the "intellectual antecedents" of these disorders, and generally manifesting itself before the clinical disorder has become apparent. Thus an earlier (or "higher") stage of the spatial agnosia associated with right parietal lesions is manifested by impairment on the Block Designs and Memory for Designs tests. Contralaterally, the aphasia, acalculia, and constructional apraxia which may be found on clinical examination with left parietal lesions are here shown to be reflected in impairment on verbal tests, Arithmetic, and again Block Designs. In their extensive study of aphasia, Weisenburg and McBride (30) reported less severe intellectual impairment in expressive dysphasics, associated with pre-central lesions, than in the receptive group, with post-central lesions; while Weinstein and Teuber (29) found significant loss on a test of "general intelligence" only with left parieto-temporal lesions: in the present study, this is paralleled by the more restricted impairment found in the left frontal than in the left parietal and temporal groups. Similar associations of impairment with site of lesion may be deduced from the data presented by Chapman and Wolff (3), though the differences tested were only those between frontal and non-frontal lesions, and impairment was arbitrarily assessed as Verbal I.Q. minus Performance I.Q. It is interesting to observe that in the present series there is some evidence, though of a lesser degree, of the impairment on arithmetical problems found by Weisenburg and McBride with right hemisphere lesions.

The impairment on Weigl's sorting test, found in an earlier series by McFie and Piercy (12) to be significantly associated with left-sided lesions, is again demonstrated in the present series, with the suggestion that it is greater with parietal lesions. Klebanoff *et al.* (10), commenting on the earlier report, thought that "these results somewhat contradict those of Anderson (1) whose studies with the Wechsler-Bellevue subtests showed opposite results for patients with dominant and non-dominant hemisphere lesions. Here the former patients proved inferior in verbal tests and superior in

performance tests." The apparent contradiction may be the consequence of the inclination of Klebanoff *et al.* toward the views of Goldstein, with the implication that an abstraction test should be sensitive to a lesion irrespective of location. If, however, it is accepted that Weigl's sorting test is an abstraction rather than a performance test, and that impairment of abstraction is just as much a focal deficit as are other aspects of intellectual impairment (associated with left parietal lesions), then the contradiction is resolved.

The present data also confirm the earlier finding of greater impairment on Picture Arrangement with right-sided lesions, and make it clear that the greatest losses are with temporal lesions on this side. Focal losses on this test have also been reported by Milner (17), though without evidence of greater losses with right than with left temporal lesions; and Reitan (21) has recently presented similar findings, related specifically to right temporal lesions. Reviewing the evidence, it appears that this focal impairment on the Picture Arrangement test is most marked with lesions involving the anterior part of the right temporal lobe or the inferior parts of the right frontal lobes—regions which are closely related anatomically and also physiologically (Kendrick and Gibbs (9)).

The results with tests of retention and learning show that impairment depends to a considerable extent on the material to be retained. With verbal material (except for learning digits) impairment is greatest with left-sided lesions, being most marked in the left temporal group; while with visual material, losses are greater with right-sided, particularly parietal, lesions. There is a suggestion that if the material to be retained is neither verbal not visual (as in the estimation of time elapsed) impairment may have general rather than focal associations. Paradoxically, difficulty in learning a series of digits one longer than the immediate span appears also to be non-specific, as far as site of lesion is concerned. This finding confirms the observation of Zangwill (32) that immediate span is reduced in dysphasia, while impairment of digit learning is found with a variety of types of organic deterioration.

There is some interest in the result of analysis of the individual records in relation to the handedness of the patients. None of the left-handed patients showed evidence that there was any transposition of laterality in intellectual functions. This is in accord with the recent view of Penfield and Roberts (18) that "the left hemisphere is usually dominant for speech regardless of the handedness of the individual." On the other hand, a number of (right-handed) patients showed a degree of inconsistency in their results that could be interpreted as evidence of some ambiguity, if not of actual transposition, of laterality. This inconsistency may be due in part to the known variability of subtest scores (*cf.* Jones (8)) but in a number of cases the impairment exceeds the range of variation normally expected. It may be that these cases manifest a similar departure from normality, though in a slighter degree, to cases of dysphasia associated with right hemisphere lesions, of which 136 were collected from the literature by Penfield and Roberts (18). The data suggest that this ambiguity may be manifested more often with lesions of the right hemisphere; and this may be contrasted with the findings on somatosensory tests of Semmes *et al.* (25) who reported that "lesions of the left hemisphere produced bilateral or ipsilateral sensory impairment more frequently than lesions of the right hemisphere."

CLINICAL IMPLICATIONS

Perhaps the most obvious conclusion to be drawn from this study is that from the psychological point of view there is no such single entity as "brain damage," making it

unlikely that any single test will be found to discriminate between "organic" patients and others. It has been shown that the area of intellectual impairment will vary considerably according to the locus of cerebral damage, even to the extent of lowering scores on verbal tests more than those on performance tests. It may appear then that, with the range of normal variation on many of the tests and the variable effects of cerebral lesions, there is little point in attempting a psychological assessment of neurological cases.

Piercy (19) has suggested, however, that the problem should be approached from the clinical standpoint: that is, that a patient's performance should be described not so much in terms of extent of deviation from statistical normality as in terms of extent of approximation to an established syndrome or abnormality. Seen in this light, these results point the way to a more realistic use of test procedures. As far as cases of suspected cerebral lesion are concerned, the psychologist can tell the neurologist whether or not the patient's performance resembles that of typical cases of lesion in one of the major cerebral lobes; and the neurologist can combine this information with evidence from other procedures in arriving at his assessment.

Besides suggesting certain constellations of deficits commonly associated with lesions in different locations, this survey also supports the assumptions underlying the calculation of the Deterioration Loss of Wechsler (27). The evidence that Vocabulary score is not significantly affected by lesions in any location, other than left temporal, and that Picture Completion is not at all affected, justify their selection as "Hold" subtests, and make it likely that they provide a good estimate of premorbid intelligence, while the sensitivity of other tests to lesions should provide a basis for estimation of impairment. In fact, a preliminary comparison of measurements of width of lateral ventricles, in patients with normal or symmetrically enlarged ventricles, with calculated Deterioration Losses, shows a significant positive correlation between the two values. This lends confirmation, and adds precision, to the survey by Gosling (7), who found a significant correlation between clinical dementia and pneumoencephalographic evidence of atrophy. While these results are necessarily more tentative than those with localized lesions, they nevertheless suggest the clinical value of this estimate of deterioration.

Hand in hand with the contribution which test results can make to diagnosis goes the assistance which they can give to evaluation of treatment. In cases of non-neoplastic lesion, careful assessment of the patient's deficits will indicate the tasks which he should avoid or circumvent, and the functions on which re-education should concentrate. In cases where the range of disabilities exceeds the expected consequences of the lesion, some degree of psychoneurotic exacerbation may be involved. Following surgical removals, it is particularly important to follow the course of improvement as it involves both general and special abilities; and in degenerative conditions, it is valuable to follow the course of the deterioration, with the aim of assisting the patient to cope with his disabilities.

At the same time, it must be emphasized that this study does no more than demonstrate an association between certain types of cerebral lesion and certain patterns of intellectual impairment. It cannot be claimed that any of these patterns constitutes a basis for a test of "brain damage"; and there is no evidence that similar patterns of impairment may not be shown by patients with psychotic, neurotic, metabolic, or other disorders capable of affecting cerebral function. Although the psychologist may conclude that one of these causes of dysfunction is the most likely, it remains for the clinician

to integrate all the available evidence in making his diagnosis.

SUMMARY

This paper presents the results of an analysis of psychological data obtained from 215 unselected patients with localized cerebral lesions, and from 51 patients in whom pneumoencephalography enabled the cross-measurement of the bodies of the lateral ventricles to be made, on subtests of the Wechsler scales and on tests of abstraction, retention and learning. The data demonstrate that certain intellectual abilities, including abstraction, are selectively impaired by lesions in different locations, and that retention tests are similarly impaired according to the material to be retained. There is no evidence that left-handedness is associated with transposition of laterality of intellectual functions, but a proportion of right-handed patients showed anomalous patterns of impairment.

Correlations of measurements of the lateral ventricles with test results show a highly significant positive relationship with Wechsler's Deterioration Loss, but no significant relationship with scores on other tests.

It is suggested that identification of defined syndromes or patterns of impairment on psychological tests would be of more value to the neurologist than search for an indicator of "brain damage."

REFERENCES

1. Anderson, A. L., Effect of laterality localization of focal brain lesions on Wechsler-Bellevue subtests. J. Clin. Psychol., **7:** 149–153, 1951.
2. Bruijn, G. W. *Pneumoencephalography in the diagnosis of cerebral atrophy*. H. J. Smit., Utrecht, 1959.
3. Chapman, L. F. and Wolff, H. G. The cerebral hemispheres and the highest integrative functions of man. A. M. A. Arch. Neurol., **1:** 357–424, 1959.
4. Critchley, M. *The Parietal Lobes*, pp. 387 and 395. Arnold, London, 1953.
5. Fox, C. and Birren, J. E. Intellectual deterioration in the aged. J. Consult. Psychol., **14:** 305–410, 1950.
6. Goldstein, K. *Language and Language Disturbances*, p. 119. Grune & Stratton, New York, 1948.
7. Gosling, R. H. The association of dementia with radiologically demonstrated cerebral atrophy. J. Neurol. Neurosurg. Psychiat., **18:** 129–136, 1955.
8. Jones, H. G. The evaluation of the significance of differences between scaled scores on the W.A.I.S. J. Consult. Psychol., **20:** 319–327, 1956.
9. Kendrick, J. F. and Gibbs, F. A. Interrelations of mesial temporal and orbital frontal areas of man. A. M. A. Arch. Neurol. Psychiat., **79:** 518–524, 1958.
10. Klebanoff, S. G., Singer, J. L. and Wilensky, H. Psychological consequences of brain lesions and ablations. Psychol. Bull., **51:** 1–41, 1954.
11. Lashley, K. S. *Brain Mechanisms and Intelligence*. Univ. of Chicago Press, Chicago, 1929.
12. McFie, J. and Piercy, M. F. The relation of laterality of lesion to performance on Weigl's sorting test. J. Ment. Sci., **98:** 299–305, 1952.
13. McFie, J. and Piercy, M. F. Intellectual impairment with localised cerebral lesions. Brain, **75:** 292–311, 1952.
14. McFie, J., Piercy, M. F. and Zangwill, O. L. Visual-spatial agnosia associated with lesions of the right cerebral hemisphere. Brain, **73:** 167–190, 1950.
15. McFie, J. and Zangwill, O. L. Visual-constructive disabilities associated with lesions of the left cerebral hemisphere. Brain, **83:** 243–260, 1960.
16. Meyer, V. Critique of psychological approaches to brain damage. J. Ment. Sci., **103:** 80–109, 1957.
77. Milner, B. Intellectual functions of the temporal lobes. Psychol. Bull., **51:** 46–52, 1954.
18. Penfield, W. and Roberts, L. *Speech and Brain Mechanisms*, p. 102. Princeton Univ. Press, Princeton, New Jersey, 1959.
19. Piercy, M. F. Testing for intellectual impairment. J. Ment. Sci., **105:** 489–495, 1959.
20. Raynor, R. B., Payne, R. S. and Carmichael, E. A. Epilepsy of late onset. Neurology, **9:** 111–177, 1959.
21. Reitan, R. M. *The Effects of Brain Lesions on Adaptive Abilities in Human Beings*, p. 16. Indiana Univ. Medical Center, Indianapolis, 1959.
22. Robertson, J. P. S. and Batcheldor, K. J. Cultural aspects of the W.A.I.S. in relation to British mental patients. J. Ment. Sci., **102:** 612–618, 1956.
23. Rylander, G. Personality changes after operations on the frontal lobes. Acta. Psychiat. Neurol., suppl. 20, 1939.

24. SCHILLER, F. Aphasia studied in patients with missile wounds. J. Neurol. Neurosurg. Psychiat., **10:** 183–192, 1947.
25. SEMMES, J., WEINSTEIN, S., GHENT, L. AND TEUBER, H. L. *Changes in Somatosensory Functions after Penetrating Brain Wounds in Man*, p. 52. Harvard Univ. Press, Cambridge, 1960.
26. TERMAN, L. M. AND MERRILL, M. A. *Measuring Intelligence*. Harrap, London, 1937.
27. WECHSLER, D. *The Measurement of Adult Intelligence*, 3rd ed. Williams & Wilkins, Baltimore, 1944.
28. WEIGL, E. An experimental study of the effects of cerebral lesions. J. Abnorm. Soc. Psychol., **36:** 3–18, 1941.
29. WEINSTEIN, S. AND TEUBER, H. L. Effects of penetrating brain injury on intelligence test scores. Science, **125:** 1036–7, 1957.
30. WEISENBURG, T. H. AND MCBRIDE, K. E. *Aphasia*, pp. 331–332. Commonwealth Fund, New York, 1935.
31. YATES, A. J. The validity of some psychological tests of brain damage. Psychol. Bull., **51:** 359–379, 1954.
32. ZANGWILL, O. L. Clinical tests of memory impairment. Proc. Roy. Soc. Med., **36:** 576–580, 1943.

PEDOPHILIA EROTICA

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Accounts of morbid sexual practices of adults upon children are likely to arouse public indignation and excite medical interest. Curiously, however, Nabokov's best selling novel *Lolita* provoked neither disgust nor condemnation. The purpose of this paper is to review briefly the literature on pedophilia, particularly with regard to etiological considerations, to present three cases of this perversion and to offer some observations on the psychodynamics of this condition.

There were surprisingly few data available in recent literature, considering the not uncommon occurrence of pedophilic activity. Although Kinsey (13) reported that "only a few males have intercourse with very young girls," Magnus (15) found that of the 1500 to 1600 persons prosecuted annually in the state of California for sexual offenses, "crimes against children and youths account for the majority." In this connection, Pisetsky (17) notes that many, if not most, cases of indecent exposure to children, manipulation of their genitalia and even actual rape go unreported. This is due, he feels, to the fear of the children to discuss sexual matters with parents and the reluctance of the parents to report the event to the authorities.

Ellis (3) described a single case in 1906. He attributed the abnormality to those individuals "whose normal energies are inhibited sometimes" and who "find the symbols of sexual gratification in the caresses of children." Forel (5) described a condition which he called "pederosis." He reasoned that the syndrome was caused by either "senile dementia" or "the existence of a special hereditary perversion in this direction." It was Krafft-Ebing (14) who coined the term *pedophilia erotica*. He felt that these "psychopathological cases of immorality with children" could be reduced "to conditions of *acquired* mental weakness." He meant chronic alcoholism, head injuries, apoplexy, syphilis and epilepsy. Freud (6) described pedophilia as the perversion of the person "who is cowardly or has become impotent."

It was not until 1927, when Cassity (2) reviewed a series of four cases at Bellevue Hospital, that any attempt at dynamic interpretation of case material was made. He distinguished two types of pedophiles etiologically. In the first variety the morbid sexual activity developed because of severe trauma during weaning with consequent paucity of maternal warmth, sustenance and stimulation. This, theoretically creates a great deal of hostility to the maternal figure which in later life is displaced on to small female children. The second type of pedophile engages in this perversion as a result of distorted identification with the mother figure. Hoppel (10) is quoted as describing a case in which the patient "was able to fix love only on objects which had no connection with the father and no resemblance to the mother, which called to mind no castration fears. His love fixed on an object like himself at the narcissistic period." The patient therefore is apparently acting out the role of the mother himself and treating the child as a projection of himself during his earliest years of life.

In 1926 Hadley (7) described a case of the aberration and postulated that it was based on an overly long mother-infant relationship perhaps with some early maternal erotic interest towards the child. He further theorized that his patient's desire to kill

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a small girl with whom he had had relations was related to a desire to destroy his own incestuous impulses, which this child represented.

Twenty years later, further comment on similar sexual offenders occurs. Most of this is based on material derived from individuals arrested and imprisoned for illegal sexual acts. Many of these papers are reviewed in Karpman's (12) comprehensive work on sexual offenders, and he himself reports one case (11) in which he attributes the perversion to fear of female pubic hair, which is avoided by having relations with prepubescent girls.

Hirning (9) comments that all sexual offenses against children have a common fundamental psychopathology which prevents the individual from seeking sexual contact with a mature individual of either sex. He feels that a mature woman represents a mother figure or incestuous object; while a child represents the patient as he would prefer to be himself, that is, a small child. This concept is a recurrent theme in the available literature. Roche (18) also supports this hypothesis.

Socarides (19) recently has reported a case in which he feels "severe libidinal frustration and the consequent overpowering aggression" play "a crucial role" in the development of the perversion. He notes that the acting out involved in the case cited served to avoid the onset of a psychosis which otherwise whould have developed, and therefore the pedophilia served as "a prophylactic device."

The myth that "dirty old men" or those with senile or chronic organic brain syndromes are primarily responsible for this kind of sexual offense is statistically invalid, as shown by Magnus (16) in the California Sexual Deviation Research Study. This report indicates that the median age for child molesters was 40.7 years. Only 10 per cent of the offenders were over age 60.

Castration anxiety has not been widely noted despite the theoretical postulation of this symptom complex in the etiology of pedophilia. Fenichel (4) feels that a selection of "little girls" as object choices represents a narcissistic object choice, (*i.e.*, "treating these girls as they would have liked to be treated by their mothers"). He also notes, however, that castration anxiety may result from identifying the love object not only with one's own person, but also "specifically one's own penis."

Bowman and Engle (1) describe young adult pedophiliacs as "usually passive, immature persons without courage to attempt sexual relations with members of their own age group."

Hammer (8), in a study of 60 convicted sexual offenders at Sing Sing Prison, emphasizes that these individuals (34 of whom were heterosexual pedophiles and 15 of whom were homosexual pedophiles) have tremendous castration anxiety and feelings of "phallic inadequacy" as determined by a series of psychological tests.

CASE REPORTS

CASE 1

The first case is that of a 31-year-old white male factory worker, unmarried, who reported to the Bronx Veterans Administration Hospital complaining of "nervousness" and "Jacksonian epilepsy." The latter had never been substantiated by medical authority and our studies, including EEG, skull films, and neurological consultations, failed to disclose any evidence of convulsive disorder. During the "seizures" reported, the patient stated that he was fully conscious, underwent repetitive clenching and writhing of his fists and arms respectively and turned in his feet. The activities were not within his power to control and were as if "someone else were doing it." The patient finally revealed that he had been arrested for molesting children and had served a short sentence in a county jail. He admitted having had pedophiliac fantasies for several years and having acted them out on several

occasions prior to his arrest. He stated that he only acted out under the influence of alcohol and even then did not carry his activities beyond fondling, although this was not the feeling of the arresting officers, the court, or his own relatives. The patient rationalized his behavior by stating that he had not developed properly sexually and "somewhere along the line" had missed out on something. He viewed his pedophiliac interests as a means of reliving or reexperiencing his earlier life. He denied any early history of sexual curiosity or erotic "game playing." He also denied masturbating until late in elementary school. His masturbatory fantasies were mainly concerned with oral-genital contact with women, in which he played the active role. These fantasies persisted up until the time of hospital admission and included the distorted idea that the male participant actually chewed and ingested portions of the female genitalia. The patient was quite terrified by the prospect of the fantasy itself, as well as possibly acting it out.

The patient never dated as an adolescent nor was he able to do so following his military service. When friends asked him to go to dances, he would stand at the side of the ballroom, watch the couples dance, but felt unable to ask a girl to dance or to take her home. He felt, in fact, extremely uncomfortable when required to talk with a woman. He had been unable to have sexual relations with either adult males or females except for a very rare passive experience either homosexually or in the passive heterosexual role while intoxicated. The patient described no interests in life aside from driving the family car at high speeds and dreaming of someday owning an airplane.

The patient initially denied dreaming, but it was interesting to note that following several interviews, during which his family history and in particular his relations with his mother were discussed, he produced the following dream. "I dreamt about mountain climbing. I can't talk much about the subject, there wasn't any particular event except that I was in a precarious spot and I was afraid I would fall. I had to use all my strength and energy to get out of that spot." He was unable to associate to this dream except to recall that there were mountains and hills in Japan and Korea when he was in the service and away from home, and when he first became ill. The patient produced little else in the form of dream material except to report that he had dreamt about flying airplanes on several occasions in the past.

The patient is the middle child of three siblings. He described a very warm and close relationship with his mother which, however, was not substantiated by his older sister or younger brother, and it is felt that a good deal of this idyllic relationship existed only in his fantasy. The mother was described as being "a very busy woman, always working around the house." He felt that he was closer to his mother than to his father and had strong yearnings for warmth and affection from her, which were never fully met nor reciprocated. At the same time, the patient was fearful of her, stating, "of course I had to listen to her. I had to be home on time. When I did something wrong I was punished by her." The relationship with his father was admittedly a distant and somewhat cool one. Both the patient and his siblings described the father as being a very quiet, unobstrusive man who let the children grow up by themselves and did not become involved with their raising or development. The patient has had poor lifelong interpersonal relations with his siblings. These relations deteriorated to the level of threats on the life of either or both siblings. In return the siblings called and wrote the hospital repeatedly, hinting, pleading, and even demanding that the patient be prevented from coming home on weekend passes. Any mention of eventual discharge was met with vehement objection by them.

Clinically, the patient showed flattening of affect, absence of warmth, humor or

emotion, and difficulty in replying logically or with reasonable rapidity to questions in specific areas. These areas were associated with sexual activities and interpersonal relations. He denied hallucinations, delusions, ideas of reference, assaultive or self-destructive ideation. The patient described himself as being a quiet, reserved and detached fellow. He never argued with others nor did he have occasion to. He was aware that he had always occupied himself in menial roles, but felt that this was due to his illness which was "one in a billion."

Psychological testing[2] (including the Wechsler Adult Intelligence Scale, Bender Gestalt, House-Tree-Person Drawings, Thematic Apperception Test and Rorschach) indicated that the patient was "an orally fixated, extremely dependent individual who has never developed any clear sense of self." These tests pointed up the need of this man "to please a maternal figure who was punitive and ambivalent in her giving," and they demonstrated that he was "terrified of women whom he perceives as phallic, annihilating and threatening engulfment for whatever nurturance they may offer."

His epileptiform seizures were interpreted as being pervasive aggressive impulses, with which he was having difficulty in maintaining control.

The patient had an IQ of 101, placing him in the average range of intellectual capacity.

The diagnostic impression was "chronic undifferentiated schizophrenia in a primarily orally dependent character." This confirmed the clinical impression.

CASE 2

A 32-year-old white unmarried male, by vocation a gardener, entered the Bronx Veterans Administration Hospital with a chief complaint of "confusion" and increasing irritability over the few weeks immediately preceding admission. After a few interviews, the patient revealed a continuous history of pedophiliac practices of many years duration, consisting of not only fantasy but also of overt acts.

This man's first sexual experience aside from masturbation, occurred at the age of 16 when he was fellated by an older man. He had not had heterosexual experience until he was in the army in W.W. II, when he was seduced by a prostitute. This occurred on two occasions, and he was able to reach orgasm only the second time. It was shortly after this episode that he sought elective circumcision for no apparent reason. A few weeks after the operative procedure, the patient was found absent without leave in a distant city apparently in a fugue state. He was hospitalized and diagnosed as suffering from an acute undifferentiated schizophrenic reaction. Since that time, the patient has been able to have only two sexual experiences, both with prostitutes, and both under some pressure from male friends who had accompanied him on an evening "out." He did, however, have pedophiliac relations with at least seven children since the end of W.W.II. These were with both male and female children and included fondling, mutual masturbation, sodomy and insertion of the penis into the inguinal region and external labial area of the female children. The patient had never been reported by any of the children nor did he believe he was suspected by any of the parents.

He was hospitalized twice following his army discharge. On both of these occasions the onset of symptoms (ideas of reference and depersonalization) occurred after a period of several months of abstinence from his perversion. It also seems significant to note that during the present admission, the patient's mental status fluctuated considerably and perceptibly. It was ascertained that these fluctuations were related to his sexual activities in the sense that his confusion and ideas of reference cleared after pedophiliac

[2] All psychological tests were prepared by, or under the supervision of, Dr. Nathan Boxer, Assistant Chief, Clinical Psychology, Department of Psychiatry and Neurology, Veterans Administration Hospital, Bronx, New York.

gratification and were aggravated by several weeks of abstinence. Phenothiazine medication was successful in reducing the anxiety and thinking disorder and the concomitant drive to act out the perversion.

He was the oldest of three siblings, having a younger sister born when he was four and a brother when he was eight. His mother died when he was fourteen, during childbirth. The patient stated that he had been quite close to her prior to her death, but no more so than his siblings. He described warm but not overly tender feelings towards these siblings, somewhat akin to his feelings towards his father and later his step-mother. He recalled feeling jealous of them while he was a child. Nevertheless, he denied any ill feeling towards the youngest child, which actually caused his mother's death. This child died a few months after the death of the mother. He had some friends but none that may be described as close. He was able to go out on occasional dates with women but was most uncomfortable during these evenings, and was unable to be with the same girl more than once.

The patient described himself as a jovial, self-effacing, well liked individual with a wide circle of acquaintances and companions. He was somewhat grandiose in his self evaluation as a raconteur and conversationalist insofar as could be determined in group therapy sessions. His self image as an expert at volley ball was exaggerated, according to the hospital correctional therapists.

On admission he showed a clinical picture of a chronic, undifferentiated schizophrenic. There were ideas of reference, paranoid delusions, looseness of associations and flatness of affect. As noted above, these symptoms cleared after a course of phenothiazines and after being transferred to the open ward. He then revealed that he had been actively engaged in a pedophiliac affair with a boy, while home on pass. He was ordered to desist, agreed to do so, and several weeks later was given a trial leave from the hospital. He returned within three weeks, exhibiting symptoms similar to those seen upon admission. He maintained that he had not engaged in his perverse activities, but had for the most part remained alone in his room in an effort to stay away from temptation. He also noted that the drugs given him seemed to help at first, but after several days he discontinued their use for no apparent reason. Upon return to the hospital, the patient was given a further course of drugs in combination with small doses of insulin (15 units B.I.D.) and group psychotherapy. In addition, because of the author's interest in this particular pathological phenomenon, the patient was seen in individual interviews weekly for several months. During this time, the patient revealed that he had had multiple fantasies consuming "most of the time during the day." These were usually about sexual intercourse with young female children. Others included having young boys masturbate him and his performing sodomy upon them. There was some confusion evident in his mind about female genitalia, their appearance and actual function. He was quite reluctant to discuss this with the therapist.

The patient produced one early memory in which he recalled observing, at the age of five, a young girl removing her undergarments in the presence of several young boys of his own age. He recalled "looking in amazement" and stated "I was a little frightened about it." He was unable to explain his fear but denied that it could be because of the girl's lack of a penis. He followed this with another early memory of a young boy being beaten up by several playmates and himself. He again recalled being frightened without knowing why. "I just didn't like them doing it," was his only comment.

The patient was unable to recall his dreams, although he had several nightly. On one occasion, however, he did relate dreaming of being tied to a stake while several painted, long braided, Indians were dancing around him waving tomahawks in

the air. He related this to a long standing fear of being alone and lost in the woods.

His feelings about children were reflected in early sadistic memories about children being struck by adults or other children. His first pedophiliac experience, at the age of fifteen, was precipitated by a spanking which he administered to a naked eight-year-old boy in his charge at a summer farm camp.

Psychological testing (including the Wechsler Adult Intelligence Scale, Sentence Completion, Bender Gestalt, Figure Drawings, Thematic Apperception Test and Rorschach) was carried out. The obtained (Wechsler) IQ was 100.

Projective testing indicated that the patient "experienced severe oral deprivation, receiving neither love nor understanding from either of his parents." He was felt to possess a mother image "of a threatening, castrating, unapproachable female, *e.g.*, a "witch breathing fire from her mouth."

He was described as feeling hopeless about himself and distrustful of others. "He sees people (including himself) as being out for what they can get, with little concern about misusing others." His pedophilia was viewed in terms of "his avoidance of the severe castration threat of women," and possibly as "an autoerotic fixation on himself as a child."

It was felt that the patient, at the time of testing was in a state of remission from a basically schizophrenic illness. This was in accord with the clinical diagnosis of schizophrenic reaction, undifferentiated type.

CASE 3

A 26-year-old white unmarried male, recently discharged from the Air Force, entered the Bronx Veterans Administration Hospital because of inability to get started in civilian life, confusion and anxiety. He revealed a history of pedophiliac interests for several years prior to admission, which included a "love affair" with a ten-year-old boy, and an attempted seduction of a nine-year-old boy. He described the first of these affairs as being the only time in his life when he felt warm, close, and needed by another person. He had several heterosexual experiences with prostitutes and women picked up at bars. He denied homosexual activities with adult males and recalled being severely traumatized as an adolescent when he was followed on two occasions by "a man" down dark lonely roads. He feared sexual assault and described escaping just "in the nick of time" on both occasions.

This man was the third of five children. The children were spaced two years apart. The mother was described in very unemotional terms as a busy, unhappy woman burdened with five children and deriving little satisfaction from life. The patient felt that he got little warmth or affection from her. The father was reported as being an alcoholic who was primarily interested in his own bodily comforts, and who devoted minimal time to the patient aside from usually providing for his sustenance. The parents fought frequently and slept in separate rooms. The patient slept with his mother and younger sister in the maternal bed until the age of ten. The father and two brothers slept in another room and the older sister had a room to herself. One of his early memories was that of a primal scene at the age of seven.

At this time the patient described his parents as being "both alcoholics." The brothers were thought to be disturbed and the oldest sister was said to be an alcoholic, who would "sleep with anyone in town." The younger sister was married happily and lived in a distant town. The patient described one episode in which the older sister attempted incest with him while she was intoxicated. Another episode was reported during which a sister-in-law tried the same thing. He recalled being tempted but desisting at the very last moment on both occasions.

Clinically, he showed a flattening of affect. There was a history of several recent episodes of disorientation and fugue-like states

similar to those described in the second case, above. During these episodes, the patient felt that he was unable to control his activities, which included running aimlessly through the streets of London on several occasions.

In evaluating himself, the patient felt that he was a mild-mannered, somewhat shy person who rarely became angry or showed hostility towards others. He also felt that he had a good deal of latent talent, ability and importance which were not fully appreciated by others.

This patient was placed in individual psychotherapy on a twice weekly basis for a period of three months. During this time he had great difficulty in keeping appointments and arriving on time. He revealed in therapy that he always felt that he was the good child in his family and that the others were bad and should "be punished more." He also felt that his mother had been good to her other children, and to her grandchildren, but not to him. A good deal of anger towards children was quite easily discernible.

In treatment, the patient openly discussed his distrust of women and fear of becoming involved with them emotionally because "women are not to be trusted, they will run out on people who get too close to them." He then recalled how distressed he had been after having been shipped overseas, while making a tape recording to send to his mother. He became incoherent, tearful and shortly thereafter had a dissociative episode. Both of these events were immediately preceded by an abortive "love affair" with a nine-year-old boy.

The patient was unable or unwilling to describe or produce any dreams during his hospital stay, but he did recall and describe the frequent sexual fantasies in which he indulged during masturbation. These primarily dealt with oral-genital contact, especially cunnilinguis. He had never performed this act himself and was unable to explain why. He did admit performing fellatio with his pedophiliac partner in both passive and active roles.

The patient's reactions at the time of hospital discharge were worthy of note. He displayed considerable anxiety about leaving and brought forth multiple somatic symptoms to lengthen his stay. These included abdominal, inguinal and vertebral aches. On the day of discharge, the patient dramatically (and unneccessarily) slid into second base during a softball game at the hospital, causing multiple abrasions and contusions of both thighs and hips, but this did not prevent his discharge.

Psychological testing indicated that the patient had an IQ of 106, placing him in the average range of intelligence.

The projective tests indicated difficulty in testing reality and a severe limitation of spontaneity. There was evidence of "intense overwhelming anxiety, tension, marked feelings of transience and impermanency in all of his relationships." He was felt to be a man who "has been disappointed so frequently in the past, especially in terms of not having received any warmth or affection from his mother" that he was unable to relate to anyone, especially women. No specific evidence of castration anxiety was uncovered. The extremely immature and passive-dependent nature of this man's personality was emphasized, as was his inability to form mature object relationships.

The diagnosis in this case was schizophrenic reaction, undifferentiated type.

DISCUSSION

It is of interest to note how some of the previously cited hypotheses are born out in this series. In two cases, there is the idealized fantasy of a warm, tender relationship with the mother. In the first case this is denied by the siblings and in the second it is cut short by the untimely death of the mother, at the time of the patient's pubescence. The third patient paid lip service to the idealized mother at first but quickly revealed his true feelings after the first interview.

In all three cases it is clear that the patient was and is unable to establish a meaningful relationship, let alone a sexual one with a mature female. All were able to have heterosexual relations with grown women only after having been seduced and having been placed in an essentially passive and feminine role. The woman in each case was a prostitute. Whether or not, as Hirning suggests, a mature woman represents a maternal and therefore tabooed, incestuous figure to any of them cannot be verified at this time.

That some form of castration anxiety is present is indicated in the second case by the episode involving the patient seeking out an elective, symbolic castration (*i.e.* circumcision) after having heterosexual activity for the first time and by the subsequent psychotic break which followed these events. The dream of being threatened by painted Indians with tomahawks certainly suggests fear of castration, as does the early memory of the naked girl. In a similar fashion, the third patient's early memory of feared attack in the dark may be equated with castration anxiety as well as with sexual assault.

Cassity's hypothesis of weaning trauma and paucity of maternal warmth is substantiated in the first case by the statements of his siblings as well as by his own feeling that "my mother wanted to spend more time with me and pay me more attention, but she was always so busy." In the second case, the patient recalled being told by his mother that he was breast-fed for a couple of weeks but had to be weaned, "because the milk went sour." This statement was corroborated by his father. The third patient denied any recall of weaning or early feeding memories, but did state that there was "so much going on" in the household that it was likely that "everybody didn't get everything he was entitled to." In these cases it may be postulated that there was a definite and substantial lack of maternal warmth during infancy and childhood; which was later compensated for in two instances by maternal overprotection and infantilization. All three patients report being passive, submissive, quiet, and "good" children during school days. They complied with every rule, got along well with teachers, were somewhat uncomfortable with peers and, in general, played the role of the "mamma's boy" during childhood. All describe weak, distant and uninterested fathers. It seems that these men grew physically to maturity, but emotionally retained the self image of a small, ineffectual, and to a large extent, asexual prepubescent boy. In all three cases this was borne out by their remaining in the parental home till the day of admission to the hospital.

The first patient, after a 10-year illness, first sought hospitalization when his mother required surgical treatment. Apparently the anxiety generated by actual separation from the mother was intolerable.

With the second patient, whose mother died when he was fourteen, it is noted that his first pedophiliac activity occurred a year after her death. He was detected fondling a seven year old boy.

The third pedophile had a somewhat more intimate maternal attachment, sleeping in the mother's bed until the age of ten, and viewing the father as a threatening, boisterous and drunken individual. His relationship to the mother and his identification with her seem even more significant than in the preceding cases. Her apparent rejection of him at ten years, and her alcoholism may be seen as a delayed instance of weaning, (separation from maternal warmth and protection) during prepubescence. The pedophilia in this case may be considered as a desire to return to the relative warmth and safety of mother's bed, which prior to the age of ten was available to him.

The author suggests that in addition to the other dynamic factors presented, the fear of maternal separation may play a large part in the etiology of this syndrome. These men were (in some degree) infantilized and overprotected by the mother. They probably

harbored hostility toward her because of this but, on a deeper level, were indeed helpless, small boys who could not survive as adults away from the mother. As a result, when faced with the biological necessity of responding to their sexual drives, they failed in mature heterosexual expression and instead substituted a prepubescent image of themselves which was projected on to their pedophilic partners. In this way there was an outlet for sexual energy which enabled the patient to retain the idealized and distorted image of himself as a small child. Parallels may be drawn to Sir James Barrie's "Peter Pan," who also was a forever youthful, carefree, prepubescent boy. To substantiate the great significance of maternal separation in each case, it is of interest to note that each man had his first psychotic episode while away from home (in the armed forces) for the first time. The mountain climbing dream of the first patient, with its concomitant fear of falling and danger, seems to fit into this picture. The psychotic reaction of the third patient, after sending a tape recording to his mother, and the beginnings of some psychotic symptoms in the second patient while aboard ship for overseas duty, lend further weight to this hypothesis. The manipulations of the third patient, when threatened with departure from the warm and protecting hospital, seem to be further specific proof of the importance of separation anxiety in this man.

Psychological tests in each case emphasize the oral deprivation and need for maternal warmth in each individual. This was the only dynamic mechanism common to all, although castration anxiety was referred to in two instances. Another common finding in keeping with the emphasis on oral needs was the preoccupation of each man with oral-genital perversion and its prominence in their fantasy life. This further substantiated, in the author's opinion, the polymorphous perverse nature of these patients' pathology and their deeply rooted and fixated immaturity.

All three patients expressed unkind and in one case murderous feelings towards their siblings. It was determined that such feelings had existed since childhood. Certainly, the performance of pedophilia itself is an extremely hostile act to children. A great deal of harm may be done to the child, and the perpetrators are not unaware of this. These men describe themselves as, and appear to be, mild, passive, harmless individuals who are usually unable to express aggression in any manner. It would seem therefore, that in addition to a symbolic expression of anger and rage at the maternal figure, they are also, in effect, directing the same feelings against their siblings. They are unable to express these feelings towards adults, and apparently use their perverse activity as a sort of safety valve. This is in accord with some of the views expressed by Socarides.

Two further clinical observations have been made in all three cases. First, all patients had an episode of depersonalization. This includes fugue-like states in the second and third cases. In the first patient there was the feeling that he was not in control of his body for brief periods of time. Second, was a grandiosity, noted not only by the author but also by members of the hospital staff and patients.

Since all three patients were suffering from a schizophrenic illness, therapy in each case was mainly supportive. An attempt was made to point out the social taboos involved in a perversion of this kind, and the consequences of apprehension were clearly delineated. This was done in an effort to persuade these men to seek follow-up care after discharge. It was impressed upon them that if they were to remain on supportive therapy in conjunction with moderate doses of phenothiazine derivatives, their prognosis would in all likelihood be favorable. The presence of a somewhat warm, sympathetic therapist to guide them might theoretically diminish the effects of one of the dynamics (maternal separation) and thereby help to

avoid acting out the anxiety by engaging in a pedophiliac act.

SUMMARY

The literature concerning pedophiliac perversion is reviewed and three cases are reported. The discussion notes several similarities among these cases. These include: a) early infantile deprivation, b) fear of maternal separation, c) a great deal of sibling rivalry and hostility, d) inability to directly express aggression, e) some degree of grandiosity, f) one or more episodes of depersonalization, and g) a clinical diagnosis of schizophrenia.

REFERENCES

1. Bowman, K. and Engle, B. Review of scientific literature on sexual deviation. California State Department of Mental Hygiene. *California Sexual Deviation Research*, pp. 115–116. Sacramento, 1953.
2. Cassity, J. Psychological considerations of pedophilia. Psychoanal. Rev., **14:** 189–199, 1927.
3. Ellis, H. *Studies In The Psychology of Sex*, Vol. 5, pp. 11–13. F. A. Davis, Philadelphia, 1927.
4. Fenichel, O. *Psychoanalytic Theory of Neurosis*. Norton, New York, 1945.
5. Forel, A. *The Sexual Question*, pp. 254–255. Physicians & Surgeons Book Co., New York, 1935.
6. Freud, S. *Three Essays on the Theory of Sexuality*, pp. 26–27. Imago, London, 1949.
7. Hadley, E. Comments on pedophilia. Med. Record, **124:** 157–162, 1926.
8. Hammer, E. A psychoanalytic hypothesis concerning sex offenders. J. Clin. Exp. Psychopath., **18:** 177–184, 1957.
9. Hirning, L. In *The Sexual Offender in Custody: Handbook of Correction Psychology*, Linder, R. and Seliger, R., eds., pp. 233–256. Philosophical Library, New York, 1947.
10. Hoppel, C. As quoted in Cassity, J., op. cit.
11. Karpman, B. A case of pedophilia (legally rape) cured by psychoanalysis. Psychoanal. Rev., **37:** 235–276, 1950.
12. Karpman, B. *The Sexual Offender and His Offenses*. Julian Press, New York, 1954.
13. Kinsey, A., Pomeroy, W. and Martin, C. *Sexual Behavior in the Human Male*, p. 558. Saunders, Philadelphia, 1948.
14. Krafft-Ebing, R. von. *Psychopathia Sexualis*, pp. 554–55. Physicians & Surgeons Book Co., New York, 1935.
15. Magnus, A. Sex crimes in California. California State Department of Mental Hygiene. *California Sexual Deviation Research*, pp. 38–40. Sacramento, 1953.
16. Magnus, A. Sex crimes in California. California. State Department of Mental Hygiene. *California Sexual Deviation Research*, pp. 25–26. Sacramento, 1953.
17. Pisetsky, J. Personal communication.
18. Roche, P. Sexual deviations. Federal Probation, **14:** 3–11, 1950.
19. Socarides, C. Meaning and content of pedophiliac perversion. J. Amer. Psychoanal. Assoc., **7:** 84–94, 1959.

DANGEROUSNESS AND MENTAL ILLNESS

Some Observations on the Decision to Release Persons Acquitted by Reason of Insanity[1]

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On July 10, 1958, Edith L. Hough, following her trial for murder in the District of Columbia, was found not guilty by reason of insanity. Consequently she was committed to Saint Elizabeth's Hospital for treatment and custody. On October 20, 1958, approximately three months later, Dr. Winfred Overholser, the hospital's superintendent, notified the trial court that "Miss Hough has now recovered sufficiently to be granted her conditional release . . ." In response to an objection by the United States Attorney, a hearing was held before a trial judge who, after listening to the testimony of several psychiatrists, denied the release and directed the superintendent to discontinue his practice of allowing Miss Hough to leave the hospital for short periods during the day except when in the custody of a hospital attendant. The judge found that she had not "recovered her sanity" and that it had not been established that she "will not in the reasonable future be dangerous to herself or others." In reaching his decision, he found that the psychiatric testimony demonstrated that Miss Hough was still suffering from a schizophrenic reaction of the paranoid type and that she lacked any insight concerning the seriousness of the killing. He also took into account the shortness of the lapse of time since trial because he felt early release would be in conflict with the function of detention as a means of imposing punishment (16).

These proceedings which followed the verdict of acquittal by reason of insanity, were held pursuant to the District of Columbia statute which provides:

> (d) If any person tried . . . for an offense . . . is acquitted solely on the ground that he was insane at the time of its commission, the court shall order such person to be confined in a hospital for the mentally ill.
>
> (e) Where any person has been confined in a hospital for the mentally ill pursuant to subsection (d) . . . and the superintendent of such hospital certifies (1) that such person has recovered his sanity, (2) that, in the opinion of the superintendent, such person will not in the reasonable future be dangerous to himself or others, and (3) in the opinion of the superintendent, the person is entitled to his *unconditional release* from the hospital, and such certificate is filed with . . . the court in which the person was tried, and a copy thereof served on the United States Attorney . . ., such certificate shall be sufficient to authorize the court to order the unconditional release of the person so confined from further hospitalization at the expiration of fifteen days from the time said certificate was filed . . .; but the court in its discretion may, or upon objection of the United States Attorney . . . shall, after due notice, hold a hearing at which evidence as to the mental condition of the person . . . confined may be submitted, including the testimony of one or more psychiatrists from said hospital. The court shall weigh the evidence and, if the court finds that such person has recovered his sanity and will not in the reasonable future be dangerous to himself or others, the court shall order such person unconditionally released. . . . Where, in the judgment of the superintendent of such hospital, a person confined under subsection (d) . . . is not in such condition as to warrant his unconditional release but is in a condition to be *conditionally released* under supervision, and such certificate is filed

[1] This article has been written in response to an invitation, by the Editors of JNMD, for an expression of views on an article by Dr. Thomas Szasz which appeared in the July, 1960, issue (Szasz, T. S. Civil liberties and mental illness. J. Nerv. Ment. Dis, 131: 58–63, 1960).

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> . . . [it] shall be sufficient to authorize the court to order . . . release . . . under such conditions as the court shall see fit at the expiration of fifteen days from the time such certificate is filed and served . . .: *Provided*, That the provisions as to hearing, prior to unconditional release shall also apply to conditional releases . . . (16).

The trial court's interpretation of this statute was reviewed, and reversed in part, by the Court of Appeals. It affirmed that temporary leaves are regulated by the release statute and are to be treated as *conditional* releases. It reversed and ordered a new hearing on the ground that the lower court had ignored the essential distinction between the criteria for conditional and unconditional releases. The opinion emphasized the underlying policy of the statute, "to provide treatment and cure[4] for the individual [as a 'patient' not a 'prisoner'] in a manner which affords reasonable assurance for the public safety" (16).

The procedures described call into question the extent to which the community, through its legislature, courts, and mental hospitals, has a role to play in determining the detention or release of persons committed to mental institutions as a consequence of an acquittal by reason of insanity. This in turn raises the question of how and which community agencies are to share responsibility for such determinations. Dr. Szasz, in an article on the *Hough* case (6), presents the issues as he sees them when he asks:

> [I]f a psychiatrist in charge of a patient—who is *not* a convicted criminal!—regards him, in his own best judgment, as ready to leave a hospital . . ., how can he, in his professional conscience, let a court tell him that this he can not do? What is a psychiatrist "treating" the patient for, anyway? To make him a good "prisoner"? The farcical, were it not tragic, character of the notion of mental illness is well illustrated by these impossible dilemmas into which psychiatrists and lawyers place themselves, each other, their patients, and their clients.

Szasz seems to conclude:

> [A]cquittal by reason of insanity, followed by automatic commitment, seems to lead by easy steps to preventive jailing (hospitalization) of persons because of their alleged future dangerousness. . . . While the court has the right to order commitment, once a patient has been committed he comes under the jurisdiction of the hospital authorities. Hospital psychiatrists should be able to release the patient should they wish to do so . . . (6).

The Szasz position rests primarily on a question-begging assumption which manifests itself in his article in a variety of ways. That assumption, which will be discussed in an evaluation of the function of these release procedures, is that an acquittal by reason of insanity is equated with all other acquittals in the criminal process. For example, he maintains the equivalence of acquittals qualified "by reason of insanity" and such outright unqualified acquittals as those based on the state's failure to establish that the individual charged committed the criminal act or those based on findings that the acts complained of were excused for such accepted reasons as self-defense or official authorization.[5] This assumption leads him to conclude that persons such as Hough are to be treated so far as release procedures are concerned as "bona fide innocent" (6) —whatever that phrase may mean. It may mean, as Szasz seems to imply, that the community has no interest in the decision of when to release a person who, though acquitted, has demonstrated an ability, not merely a propensity, to commit dangerous acts.

To determine criteria for release of those acquitted by reason of insanity, it becomes necessary first to establish the rationale for automatic commitment to a mental institution of a person thus acquitted. Logic would dictate, if Szasz is correct, that such persons, being "bona fide innocent," should be given their liberty subject only to "civil" commitment procedures applicable to all of us. But

[4] This may be a typographical error; "care," not "cure," was probably intended.

[5] Examples of authorized killings are the use of deadly force by a police officer to effect an arrest and by an executioner to administer the death penalty.

even assuming the validity of the "innocence" assumption and the logical conclusion, this does not move us very far. Whether commitments to a mental institution be *via* a "civil" or "criminal" route, their functions are substantially the same; *i.e.*, that "mentally ill" persons who evidence dangerousness to themselves or others be provided by the state with custody and care even if there is no known effective therapy or therapy is unavailable. Commitment procedures, however labelled, constitute a sanction, so far as the person confined is concerned, in the form of deprivation of liberty at least to the extent that commitment is without regard to his "wishes."[6] And a society free of such sanctions is difficult to visualize. It would require that each individual be so enlightened and free that he can become aware of his dangerousness and commit himself for the benefit of the community. Unlike a diagnosis of contagious tuberculosis (free of mental complications), cases involving mental disease may involve such distortions of reality that such awareness becomes even theoretically impossible.

Though the function of commitment to mental institutions is substantially the same, whether by a "civil" or "criminal" tribunal, the issues to be determined by each tribunal are different. In civil dispositions, primary emphasis is placed on the current mental state of the individual to determine his commitability. In the criminal procedure, primary emphasis is focused on past mental state—at the time of the offense[7]—to determine whether the offender shall be held subject to criminal sanctions; commitment is not directly an issue, but automatically follows an acquittal by reason of insanity. In effect, the defendant by raising the defense of insanity—and he alone can raise it (9, 27)—postpones a determination of his present mental health and acknowledges the right of the state, upon accepting his plea, to detain him for diagnosis, care and custody in a mental institution until certain specified conditions are met. And it should be noted that the defendant is presumed, or in special proceedings, as in the *Hough* case, actually found to be sufficiently in contact with reality to comprehend the nature and consequences of the variety of pleas and defenses available to him.[8] Within these limits, commitment *via* the criminal process is

[6] "Implicit in the word 'sanction' . . . is involuntariness. In this context involuntariness is not treated as a psychological concept. Thus, for example, imprisonment is a sanction even if imposed on a person who commits a crime in order to be punished or in order to escape cold and hunger in the 'warmth' of a jail" (2). Likewise involuntary commitment of the mentally ill is a sanction even though it might be considered a secondary gain.

[7] The determination of mental state at the time of the offense has been a time-honored element of insanity defense tests and has been retained under *Durham's* jury instruction: "If you the jury believe beyond a reasonable doubt that the accused was not suffering from a diseased . . . mental condition *at the time he committed the criminal act charged* you may find him guilty" (14, italics added). Thus if the jury believes there was no mental disease *at the time of offense* it cannot proceed to determine the second major question, which under *Durham* is whether a causal relationship exists between the mental disease and the criminal act. Requiring focus on past mental state as well as causal relationship raises a series of questions peripheral to the main problems in this Article: Is it the function of concurrence in time of mental disease and criminal act to establish causal connection by presumption? If that is its function has it become an anomaly under *Durham* which also specifically requires the introduction of evidence and a determination on causal relationship between the mental disease and criminal act? Does the time requirement invite treating mental disease as a discrete phenomenon and thus preclude jury examination of causal relationship when it is found that at the time of the crime the accused was in remission or a lucid state? Would deletion of the time factor free psychiatrists of the impossible task of trying to establish mental state at a point in the past and instead leave them to testify as to the possible causal relationship between the underlying mental illness and the offense?

[8] The question of the defendant's "sanity" may be in issue at several points in the criminal process. For example, the functions and implications of the test of competency to stand trial must be distinguished from those of the test of competency to commit a crime; *i.e.* the test of insanity as a defense. Both courts and psychiatrists frequently confuse these tests as well as others involving mental health (15).

initiated by the defendant and thus is more akin to "voluntary" than "involuntary" civil commitment.

From the time of commitment by either procedure, the issues coalesce and the crucial problems emerge—who, what reasons and what circumstances are to determine readiness for release? An examination of these problems requires, first of all, an analysis of how to define "dangerous to himself or others." In a democratic society the function of delimiting dangerousness *for release-purposes* belongs to the community. Translating community values and policies into an operational definition of dangerousness has been assigned to legislators as representatives and judges as construers of legislative determinations, and not to any particular administrative or professional group including psychiatrists. This does not imply that psychiatrists as representatives of their profession or as members of the community have no duty to inform legislators and judges with regard to making such decisions as the meaning of "dangerous to himself or others." But it does imply that, when engaged as experts to participate in a hearing to determine an individual's readiness for release, they are not to define "dangerousness" but rather to ascertain whether the individual is likely or not to engage in conduct which has been characterized as "dangerous." More specifically, for example, in deciding whether *individual* "*x*" is sufficiently "dangerous" not to be released, the psychiatrist as expert is to perform a purely diagnostic and prognostic function concerning the likely behavior of the person. But in deciding whether *behavior* "*x*" (*e.g.* homosexual acts) is sufficiently "dangerous" to preclude release, the psychiatrist as any other member of the community may attempt to influence legislative and court decisions by expressing his value preferences. By so distinguishing the roles psychiatrists may play at different points in the decision-making process, it should alert them, as well as all participants, to become aware of the extent to which value preferences permeate expert judgments. This, in turn, should prompt careful scrutiny of conclusionary statements qualified by such phrases as "on the basis of my professional opinion . . ."; expose those views which primarily reflect the psychiatrist's value preferences; and thus facilitate identification of decision points at which the psychiatrist should minimize his value orientation and at which the community has the right to establish policy. This is not to suggest that experts are to avoid or can avoid value judgments but rather that they openly articulate them as such.[9]

While we share Szasz's preference for minimizing deprivations of liberty and accept it as a criterion for assessing effectiveness of release procedures, we do not share his view that this value will best be protected by leaving solely to hospital psychiatrists the decision to release "should they wish to do so" (6). Szasz seems to contend, though it is not clear, that the psychiatrist's personal concept of "dangerousness" is not a variable in his decision to release and that "dangerousness" becomes operative only if the decision must be shared with the courts. He seems then to conclude that unless "dangerousness" is eliminated as a variable in the release-decision, "hospitalization" becomes "preventive jailing"; "patients" become "prisoners"; "psychiatrists" become "jailers," and "judges" become "psychiatrists." Finally he asserts that, as a result of such mystical transformations, the period of detention

[9] This is in keeping with the view expressed in the "Report of Panel on Science and Human Welfare" of the American Association for the Advancement of Science which says, in part:

"With respect to the process of decision-making the scientist's role is simply that of an informed citizen. Like any other citizen, the scientist is free to express his opinions regarding alternative solutions for matters of public policy and will perhaps join with like-minded citizens in a group effort to foster the solution he prefers.

"This role does not derive from the scientist's professional competence or obligations but only from his citizenship, and therefore it bears no direct relationship to his professional organizations" (4).

in mental institutions is extended for those acquitted by reason of insanity beyond that which would be generally the practice of psychiatrists acting alone. This assertion would be correct if, in making decisions to release, psychiatrists were trained and capable of excluding considerations, both conscious and unconscious, of a patient's "dangerousness" to himself or others. But Szasz, by failing to identify the operative factors in what he calls a "psychiatrist"[s] . . . own best judgment [with regard to] read-[iness] to leave a hospital" (6), does no more than imply that this is his view. And we find it difficult to believe that there is not lurking in his phrase recognition that psychiatrists do and are trained to take into account a patient's potential for doing harm to himself or others, however defined. His assertion then would be correct only if he could establish, and there are no available data, that (1) among psychiatrists there is consensus about the meaning and degree of "dangerousness" which precludes the release of a patient and (2) compared with a court's concept of "dangerousness," a psychiatrist's is less severe or more permissive. Moreover, we know of no reason which even suggests a direct correlation between shorter periods of detention and leaving to each psychiatrist or hospital board alone the function of determining the meaning and degree of "dangerousness." Likewise, we find no reason which suggests a necessary correlation between longer periods of detention and a sharing of the release decision by psychiatrists and the courts.

The problem still remains of ascertaining and evaluating the process by which the crucial phrase "dangerous to himself or others" is to be given meaning. The task of defining and redefining, on the basis of actual cases, the meaning of "dangerousness" for release purposes has been delegated to the courts and mental health administrators (13). The desirability of this procedure, in terms of reducing threats to community well-being, maximizing individual dignity and more particularly minimizing deprivations of liberty, rests on forcing into view those factors which, though rarely articulated, are crucial variables in psychiatric and judicial decisions to release or detain. Criteria for release which amalgamate and reflect the courts' inherent interests in civil rights and the psychiatrists' primary interest in therapy will be openly defined and redefined through such interaction on specific cases. In addition, by this sharing of responsibility, the traditional tasks of each discipline are restored and anxiety concerning community responses toward the release of any given individual can be minimized as a decisional factor.[10] That this is more than mere fantasy is illustrated by the appellate decision and subsequent events in the *Hough* case as well as by other appellate interpretations of the statute.

The *Hough* decision (16), which prompted Szasz's article, did not close the door to liberty for Miss Hough. Rather, by enunciating guides for *conditional* release which the appellate court had already established for *unconditional* release (23, 26), it stimulated a series of interchanges between psychiatrist and lawyer which led to her *conditional* release. It reaffirmed, particularly for the trial judge, that length of confinement must not be related to punishment and that consideration must only be given to a patient's condition, his need for treatment and the public's safety. Further, the decision advised that trial courts fulfill their role, with regard to *conditional* releases simply by deciding whether "the evidence supports the hos-

[10] Such anxiety is reflected in the following comment by a psychiatrist:

"In the case of persons who have been arrested, particularly if charged with serious offenses, a greater degree of conservatism must be practised in the matter of release, in consideration of the attitudes of the public.

* * *

"Thus, the hospital administration is torn between two urges, one, to release as many patients as possible, the other to pursue a reasonably conservative policy so as not to cause undue risk to the patient or to those about him. It may even be that we are *too* conservative!" (5)

pital's determination that in all reasonable likelihood the patient's temporary absence from the hospital *under specified conditions* will not endanger others" (16, italics added). As a consequence the *Hough* application was returned to the trial court for rehearing with specific provision for introducing supplementary evidence. Had a rehearing taken place without the introduction of new evidence, it is more than likely that Miss Hough would have been denied release. Not only would it have been reasonable for the trial judge to conclude on the basis of the testimony by Drs. Overholser and Karpman that she was still acutely psychotic, but also from testimony by Dr. Karpman that she was still potentially dangerous at that time.[11] In addition, the conditions for release were not sufficiently detailed to permit the judge to conclude that her release would not threaten public safety. But new evidence was introduced: the attorneys for Miss Hough, alerted by the experience at the first hearing and the appellate decision, challenged the reappointment of one of the psychiatrists as her examiner. They successfully and appropriately argued that because of his lifelong personal relationship with the Hough family and his personal feelings toward her it would be "impossible" for him to conduct an interview with her "in an atmosphere of mutual confidence and respect" (20, 28). On the basis of new diagnostic evaluations by psychiatrists not personally involved with the Hough family and a more detailed and meaningful presentation of the conditions specified for release,[12] the trial judge, abiding by the new standards, granted her application for release (21).

The task of pouring substantive content into "potential 'danger'" which the appellate court has called "the heart of the test for retention or release" (25) has just begun. Some of the difficulties of definition are being uncovered not only in hearings to review applications for release submitted by the mental hospital but also in *habeas corpus* proceedings in which the patient challenges the mental hospital's decision to continue confinement. There are two issues: one, what kinds of behavior are sufficiently threatening

[11] "Q. In your opinion is Edith L. Hough the aggressive type of paranoid? A. [Dr. Karpman] Yes, she is the aggressive type—as evidenced by the fact that she took measures of her own in killing the man. That is aggressiveness.

"Q. In your opinion is an aggressive paranoid potentially dangerous? A. It is conceded universally an aggressive paranoid is dangerous. I would even say that universally we think that any paranoid schizophrenic is potentially dangerous, because one can never tell when the meekness and submissiveness may suddenly turn around and become aggressive.

"Q. Would you say Edith L. Hough at this time is potentially dangerous because she has schizophrenia, paranoid type? A. I would rather not answer this question directly. Ask me whether a paranoid schizophrenic is potentially dangerous, and I would say yes.

"Q. You would say yes? A. Yes" (16).

[12] *Compare* the plan submitted with the *first* application:

"The plan under which we recommend that the conditional release be granted is that in accordance with the continuation of a total plan of rehabilitation Miss Hough be permitted to leave Saint Elizabeths Hospital to go to the city of Washington, D. C., unaccompanied in an effort to obtain employment. It is recommended that this plan be carried out under very close hospital supervision and that she be subject at all times during the period of her conditional release to the supervision of the Social Service Department of Saint Elizabeths Hospital and that she report to Saint Elizabeths Hospital for examinations at such times as are designated by the authorities of Saint Elizabeths Hospital" (16).

with that for the *second* application:

"Conditional release is recommended for the purpose of providing Miss Hough with the rehabilitative support which is considered psychiatrically indicated. Her mother's home is available to her, and the Social Service Department of the hospital has been made familiar with the case to provide supervision and support outside the hospital. Our plans include Miss Hough's returning to the hospital at weekly intervals to start for continued progress interviews with a staff psychiatrist familiar with her case. Work opportunities are presently available to her and are recommended as part of the treatment procedure. By a plan which involves Miss Hough's living with her mother, under the community support of Social Service, and with regular psychiatric interviews with a physician in whom she has demonstrated confidence, the public safety is assured" (22).

to be called "dangerous" and two, with what degree of certainty must the prognosis establish the likelihood of the kind or kinds of behavior designated "dangerous" occurring over what period of time.

With regard to the first issue, no criteria for "dangerousness" have been precisely articulated. The major problem is to identify criteria for evaluating the appropriateness of the many possible responses to the question posed: Assuming mental illness requiring some form of treatment or care, what behavior should be classified dangerous enough to authorize deprivation of liberty by continued detention in a mental institution or by release under supervision? Dangerous behavior might be construed to include: (1) only the crime for which the insanity defense was successfully raised; (2) all crimes; (3) only felonious crimes (as opposed to misdemeanors); (4) only crimes for which a given maximum sentence or more is authorized; (5) only crimes categorized as violent; (6) only crimes categorized as harmful, physical or psychological, repairable or irrepairable, to the victim; (7) any conduct, even if not labelled criminal, categorized as violent, harmful, or threatening; (8) any conduct which may provoke violent retaliatory acts; (9) any physical violence towards oneself; (10) any combination of these. More or other than the kind of offense for which the defense was raised was intended, for the statute specifically adds dangerousness to self as a basis for confinement (13). However, the court has not been challenged to further sort out the kinds of behavior to be classified "dangerous" or to identify the values to be minimized and maximized. But it has already recognized the existence of these problems and registered concern, for example, about the possible need for handling differently a patient with homicidal tendencies and one with a potential for forging checks[13] (24, 25). In the absence of court-created standards, the psychiatrist, it might be argued, is in an intolerable position. Actually the opposite is true for he is presently free to apply for a patient's release on what Szasz would call "his own best judgment" (6). The psychiatrist, trained to seek release as soon as there is a therapeutic indication for such a decision, can face the court with release applications involving a wide variety of behavioral pathology and thus prompt a series of decisions giving substantive content to "dangerousness." Coupled with patient challenges to denials for release by psychiatrists, these applications will permit the court and psychiatrist to examine the values operative in their decisions. This in turn will permit the psychiatrist to more easily differentiate those aspects of his decision primarily determined by his expertise from those determined by his value preferences.[14] In sharing with the court those aspects of decision in which community values are at stake, the psychiatrist need neither be apologetic for having values nor be misled into feeling that his role as expert is being usurped (4).

With regard to the second issue, the court has emphasized from the very first construction of the statute that the psychiatrist is not required to "give an absolute guarantee that the patient will never again be mentally ill or *dangerous*. Reasonable foreseeability . . . is the test" (26). But before such verbal admonitions are consistently applied, understanding their significance must be developed by providing, as is done, an opportunity for case-by-case review of the action by

[13] Contrary to common belief, the defense of insanity is not limited to murder or capital crimes.

[14] So far as the analyst is concerned Hartmann emphasizes:

". . . There are . . . the personal moral valuations of the analyst with respect to the material presented in analysis. One cannot deny the actuality of [this] factor—it is, above all, the natural outcome of the analyst's having his own value system. . . . But . . . this . . . factor is best kept in the background in contacts with the patient; also, that in order to achieve this the analyst must be clearly aware of his own valuations and must know how to distinguish them from statements of fact. It has been doubted whether such reserve is really possible. Experience decides that it is, at least to a very considerable degree" (3).

the judge, lawyer and psychiatrist participants. Through time the ambit of the degree of certainty possible will be more clearly communicated. This should eliminate such uncalled-for psychiatric responses as the following to a question in the first *Hough* hearing about the probability of her doing "harm to herself or others?"

> "Well, there is that possibility with a great many people, some of whom have never been in mental hospitals. I can't make any guarantee about permanence, or even about the conduct" (16).

And minimally, in the event of such a response, the court should be alert to advise the psychiatric witness that certainty is not expected. Nor should the court expect consensus among experts about the potential dangerousness of any patient. Whenever consensus exists conerning the likelihood of "dangerous" behavior, the court must accept this view as a fact in its release determination. However, in the more likely absence of such consensus among experts making prognoses about human conduct, the court must finally resolve *for release purposes* the differences of opinion about potential dangerousness uncovered by the much-maligned battle of the experts (1). This is as it should be. But without deluding itself about its ability to predict, the court, in assuming this role, must continue to play the value-weighing role of balancing the unpredictable risks to liberty and public safety.[15]

There remains another complicating factor which conceptually might force an application of the statute which would conflict with its primary therapeutic function and with the fundamental function of the criminal law to safeguard every individual from the imposition of sanctions solely for his potential dangerousness.[16] Since the sickness of the individual and his need of treatment or care is the only justification for using the "likelihood of dangerousness" as a basis for deprivation of liberty,[17] the question arises: What disposition is to be made of those acquitted by reason of insanity who remain dangerous—whatever meaning will be given to that word—but who have "recovered sanity" at least to the extent that they could no longer be held had they been civilly committed? Since "recovery of sanity" *and* the unlikelihood of dangerousness are requisites for release, continued detention would be the statutory answer (13). To hold a patient solely for potential dangerousness would snap the thin line between detention for therapy and detention for retribution.[18]

[15] Dr. Manfred S. Guttmacher, in response to a request for his opinion of the first *Hough* application for release, said in part:

"I don't run a hospital. I don't have the decisions to make as to when patients should be discharged or not. I don't for a moment feel that I have the right or the competence to preempt a judge's function in deciding what risks the community should take" (10).

[16] In a habeas corpus proceeding challenging detention for civil commitment, the court ordered release despite the following psychiatric report from Saint Elizabeths Hospital:

"Dallas O. Williams at the present time shows no evidence of active mental illness but . . . he is potentially dangerous to others and if released is likely to repeat his patterns of criminal behavior, and might commit homicide."

The court said:

"Many persons who are released to society upon completing the service of sentences in criminal cases are just as surely potential menaces to society as is this petitioner, having a similar pattern of anti-social behavior, lack of occupational adjustment, and absence of remorse or anxiety; yet the courts have no legal basis of ordering their continued confinement on mere apprehension of future unlawful acts, and must wait until another crime against society is committed or they are found insane in proper mental health proceedings before confinement may again be ordered" (15).

[17] Judge Fahy, in a concurring opinion, goes further, saying:

[T]his mandatory commitment provision rests upon a supposition, namely, the necessity for treatment of the mental condition which led to the acquittal by reason of insanity. And this necessity for treatment presupposes in turn that treatment will be accorded (25).

[18] Confusion in judicial thinking about this matter is illustrated by the following statement:

"Two policies underly [*sic*] the distinction in treatment between the responsible and the nonresponsible: (1) It is both wrong and foolish to *punish* where there is no blame and where *punishment* cannot correct. (2) The Community's secu-

Though the likelihood is not great that many cases will pose this issue, the possibility of it arising has increased under the *Durham* rule (14). The meaning of mental illness for the insanity defense has been construed under *Durham* to include "psychopathic and sociopathic personalities (7, 8, 18), even though insanity for civil-commitment purposes excludes, except for the "sexual psychopath," such personality disorders (12, 17, 18, 19). Not to release such persons would in effect be to equate an undefined "dangerousness" with an undefined mental illness. Since there can be no such equation, that decision not to release would be like a decision not to discharge a tubercular patient—though no longer infectious—because he is a potential killer or check-forger. The court might, though it is doubtful, affirm the constitutionality of such denials on the theory that the patient "voluntarily" accepted these conditions for release by electing the defense of insanity. Realistically, this would stretch voluntariness to an absurd though technically logical point. Without declaring the statute unconstitutional, the court, more likely and more appropriately, would ignore the "*and*" connecting the criteria for release as has already been indicated would be done in the reverse situation by the suggestion that release would be authorized for a patient no longer dangerous even "though he has not 'recovered his sanity' " (16, 23, 24). Better still, the legislature—here Congress—should amend the statute (13) to release anyone who has "recovered sanity" and thus prohibit, if not preclude, deprivation of liberty without therapeutic justification.

Ultimately, if circularity of reasoning is to be avoided, many of the problems raised by this analysis of the decision to release persons acquitted by reason of insanity can only be resolved following a detailed reexamination of the function of the doctrine of criminal responsibility. The need for such a fundamental study is highlighted by what appears to be a fruitless and frustrating debate among and between lawyers and psychiatrists in search of a formula for insanity as a defense.

rity may be better protected by hospitalization . . . than by imprisonment" (italics added).

" 'Punish' and 'punishment' are used in policy statement (1) to suggest different underlying meanings of concepts. The word is first used as a symbol of the vengeance or retribution function of the criminal law and then used as a symbol of the rehabilitation function. *Query:* If 'punishment,' however defined, were an effective rehabilitative device would the court find its use objectionable even if blameworthiness could not be established? Is involuntary confinement for an indefinite period in a mental hospital any less a deprivation, as the court seems to imply in policy statement (2) than involuntary confinement for a limited period in a prison?" (2)

REFERENCES

1. Diamond, B. The fallacy of the impartial expert. Arch. Crim. Psychodyn., **3:** 221–236, 1959.
2. Goldstein, J. Police discretion to invoke the criminal process: Low-visibility decisions in the administration of justice. Yale Law J., **69:** 543–594, 1960.
3. Hartmann, H. *Psychoanalysis and Moral Values.* International Universities Press, New York, 1960.
4. New York Times, **109:** 6, July 8, 1960.
5. Overholser, W. The present status of the problems of release of patients from mental hospitals. Psychiat. Quart., **29:** 372–380, 1955.
6. Szasz, T. S. Civil liberties and mental illness—some observations on the case of Miss Edith L. Hough. J. Nerv. Ment. Dis., **131:** 58–63, 1960.
7. Weihofen, H. *The Urge to Punish.* Farrar, Strauss & Cudahy, New York, 1956.

LEGAL CASE REFERENCES

8. Blocker v. U. S., **274** F. 2d 572, 1959.
9. Boyd v. People, **116** P. 2d 193 (Colorado), 1941.
10. Brief for Appellee: Hough v. U. S., 1959.
11. Briscoe v. U. S., **248** F. 2d 640, 1957.
12. *District of Columbia Code* § 22-3503(1), 1951.
13. *District of Columbia Code* § 24-301 (Supp. 7, 1959).
14. Durham v. U. S., **214** F. 2d 862, 1954.
15. Durham v. U. S., **237** F. 2d 760, 1956.
16. Hough v. U. S., **271** F. 2d 458, 1959.
17. In Re Williams, **157** F. Supp. 871, 1958.
18. Malone v. Overholser, **93** F. Supp. 647, 1950.
19. Miller v. Overholser, **206** F. 2d 415, 1953.
20. Order of U. S. District Court, D. C., Criminal No. 566–57, 1960 (March 14).
21. Order of U. S. District Court, D. C., Criminal No. 566–57, 1960 (May 3).

22. OVERHOLSER, W. "Letter to U. S. District Court", 1960 (Feb. 3).
23. OVERHOLSER v. LEACH, **257** F. 2d 667, 1958.
24. OVERHOLSER v. RUSSELL, U. S. Court of Appeals, D. C. Cir. No. 15,536, 1960 (June 23).
25. RAGSDALE v. OVERHOLSER, U. S. Court of Appeals, D. C. Cir. No. 15,437, 1960 (June 23).
26. ROSENFIELD v. OVERHOLSER, **262** F. 2d 34, 1958.
27. *Royal Commission on Capital Punishment Report* (C.M.D. 8932 of 1953) §§ 442–444.
28. WHALEN, F. J., Attorney for Miss Hough. "Memorandum in opposition to Government's motion for appointment of psychiatrists, accompanied by affidavits from Miss Hough and her Mother". U.S. District Court, D. C., Criminal No. 566–57, 1960 (March 4).
29. WILLIAMS v. U. S., **250** F. 2d 19, 1957.

BINOCULAR RESOLUTION: THE STEREOSCOPIC RESPONSES OF PRE- AND POST-OPERATIVE RHINOPLASTY SUBJECTS TO PAIRED PHOTOGRAPHS OF PRE- AND POST-RHINOPLASTY PATIENTS

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This study was undertaken to determine whether or not certain differences in visual perception could be observed between two experimental groups of subjects consisting of pre- and post-operative rhinoplasty patients and a control group. Much evidence, theoretical and experimental (1, 3), supports the view that perception is a dynamic, transactional process in which emotional, attitudinal (and therefore experiential) factors significantly affect the outcome. This basic concept of perception in conjunction with Engel's study (2) of the role of content in binocular resolution suggested that differences in stereoscopic responses to certain types of stimuli might exist between our groups. In work with rhinoplasty patients it was hypothesized that their emotional investment in the nasal part of their physiognomy might influence their perception in a situation in which the nose was the focus of attention.

METHOD

APPARATUS

The basic instrument was a stereoscope, used in the manner described by Engel (2), in which pairs of matched, coincidental 2″ x 2″ profile pictures of female rhinoplasty patients taken prior to surgery, and six months subsequently, were viewed by all subjects.

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SUBJECTS

There were two experimental groups of subjects and one control group. The first experimental group was made up of 13 females who were either scheduled for a rhinoplasty or who had been deemed candidates for the operation by both the surgeon and the consulting psychiatrist and were going to be scheduled for surgery. These patients ranged in age from 15 to 46 years. The second experimental group consisted of 15 females ranging in age from 15 to 42 years who had undergone rhinoplastic surgery, none more recently than six months prior to their participation in the study. The control group consisted of 20 nurses and student nurses ranging in age from 18 to 46 years who were selected at random except for the qualification that neither they nor others considered them to have a cosmetic problem related to their noses and therefore were not considering plastic surgery.

PROCEDURE

Each subject was simply told that she was about to participate in a "perception study" that consisted of two parts, the first being to view a series of pictures in the stereoscope and the second being to answer the questions in two short, written "scales." Each subject was then shown a pair of the pictures, pre- and post-operative, and was asked to distinguish between them (the "before" and the "after") and was told these two pictures would be the first pair she would see in the instrument, but that in the stereoscope the two pictures would be fused into one image and that the experimenter wanted her to describe this image in terms of the condition

of the nose, *i.e.*, "pre- or post-operative," "before or after," "large or small nose." She was given to understand that the only difference between the pre- and post-operative pictures was in the configuration of the nose. She was further told not to look into the instrument until the experimenter indicated she should do so and that she was to use both eyes. (If the subject normally wore glasses she was asked to do so for the stereoscope examination.) She was then shown a series of ten pairs of pictures so arranged that the pre- and post-operative figures appeared alternately before the left and right eye.

With the viewing of each pair of pictures the subject was asked the following series of questions designed to elicit responses that could be categorized while minimizing the influence of the experimenter and encouraging spontaneity of expression.

1) "What do you see?" If the response to this was unequivocal, *i.e.*, "I see the pre-operative (or post-operative) nose," no further comment was made by the experimenter. If, after this first query, the subject gave an equivocal response, she was asked the next question.

2) "Do you see the pre-operative ("large," "before") nose, or do you see the post-operative ("small," "after") nose?" If there was still some uncertainty in her answering she was asked,

3) "Do you see a picture that has qualities of both noses?" An affirmative response to this was followed by:

4) "Is it one fused constant image of both noses that you see or is it one in which the image alternates between the pre- and post-operative figures?" This was followed by,

5) "Does either the pre- or post-operative figure dominate (Do you see more of either one?)" or, if the answer were affirmative for the latter half of 4),

6) "Does either image stay in your visual field longer than the one with which it is alternating?" If the subject responded negatively to 5) or 6) (which occurred infrequently) she was asked, "Do you see both figures equally?"

TABLE 1

Distribution of Responses in the Three Groups

Types of Responses:	Pre-Operative Number (%)	Equal Number (%)	Post-Operative Number (%)	Total
Control subjects	123 (61.5)	12 (6)	65 (32.5)	200
Pre-operative subjects	86 (66.1)	8 (6.2)	36 (27.7)	130
Post-operative subjects	91 (60.7)	7 (4.7)	52 (34.6)	150

The experimenter attempted to elicit responses as quickly as possible after the stereoscope was focused but without hurrying the subject.

After the above procedure each subject was administered the TDMH-Self-Concept Scale (5) and the Welsh A-Scale (6). As part of a separate study (4), those subjects who were scheduled for rhinoplasty or had undergone the operation were given a careful psychiatric evaluation before surgery and were followed post-operatively.

RESULTS

When the individual stereoscopic responses of the subjects in the control and experimental groups were totaled according to the number of pre-operative, equal, and post-operative responses made and these expressed as percentages in the respective groups, no significant differences were observed (see Table 1).

When each subject was classified according to her response pattern, it was found that all subjects fell into one of three categories: eye dominant pattern, a content dominant pattern, or a "randomized" pattern. The criteria for determining the response patterns of each individual were:

I. "Randomized" pattern;
   a) If the subject gave an equal number of pre- and post-operative responses and an equal number of left and right eye responses respectively.
   b) If there was a difference of not more

TABLE 2
Classification of Subjects According to Patterns of Response

	Control Number (%)	Pre-Operative Number (%)	Post Operative Number (%)
1. Content dominant	8 (40)	7 (54)	7 (47)
2. Eye dominant	11 (55)	4 (31)	1 (6)
3. Randomized	1 (5)	2 (15)	7 (47)
Total	20 (100)	13 (100)	15 (100)

than one response between either the pre- and post-operative responses or the left and right eye responses, or both.

II. Content dominant pattern;
a) If none of the above criteria apply and the difference between the number of pre- and post-operative responses is greater than the difference between the number of left and right eye responses.

III. Eye dominant pattern;
a) If none of the above criteria apply and the difference between the number of left and right eye responses is greater than the difference between the number of pre- and post-operative responses.

Using these criteria, each individual was classified as showing one of these three response patterns. When an independent observer used the criteria and classified the subjects there was complete agreement with the results previously obtained.

Of the entire series of 48 individuals, ten were in the "randomized" category. Of these ten, seven were in the post-operative, two in the pre-operative and one in the control group. Using the Fisher Exact Test the incidence of "randomized" as against eye dominant responses in the post-operative group was compared with that of the control group and it was found that the difference was significant at the one per cent level ($p < .01$). The increased incidence of the "randomized" pattern in the post-operative group appeared to be at the expense of the eye dominant pattern since only one of the latter occurred in the post-operative group, whereas the content dominant pattern was equally distributed among the pre-operative, post-operative, and control groups (see Table 2).

The results of the TDMH-Self-Concept Scale and the Welsh Anxiety Scale (taken out of context of the MMPI) were inconclusive. There were no significant differences or apparent trends when the test results were compared with the response patterns. This negative result was difficult to evaluate since it was apparent in some cases that the test scores were heavily influenced by the defensiveness of the patients.

DISCUSSION

From the foregoing results, it would appear that women who have undergone rhinoplasty are more apt to show a "randomized" response pattern than those who have not had this surgery and have not contemplated it. We have used the term "randomized" for want of a better description, and it refers to the fact that this pattern of response is the same as that which would be obtained if a subject were to determine his response to the stereoscope pictures by tossing a coin as he was shown each pair of photographs instead of by actually looking at them. We have hypothesized that this "randomized" response pattern may reflect a type of perceptual avoidance which is considered related to the psychologic mechanism of denial. If this is so, one would postulate that the photographs in the stereoscope symbolized anxiety-laden conflict for the women showing this type of response and that they would show a higher incidence of post-operative emotional disturbance than those who did not give the "randomized" response. We were able to ascertain which patients in the post-operative group had been independently judged as temporarily "disturbed" following surgery. In the group of 15 post-operative patients, nine had "disturbances" following surgery and of these nine, six were among the seven who

gave "randomized" responses. Two of the patients who had post-operative incidents were in the content dominant category and one in the eye dominant group. Thus it was found, as predicted, that there appeared to be a trend for individuals showing post-operative emotional disturbances to be in the "randomized" category. However, using the Fisher Exact Test, the difference between the "randomized" and content dominant groups with regard to incidence of post-operative disturbance is not statistically significant.

SUMMARY

A comparison has been presented of the results of two groups of rhinoplasty patients and a group of control subjects looking at visual stimuli in a stereoscope. A statistically significant difference was found between the control and the post-operative groups with regard to a type of response pattern termed "randomized." A hypothesis is presented explaining this difference on the basis of anxiety aroused by the stimuli in the emotionally labile patient which becomes manifest as a reluctance to make definite judgments, resulting in "randomized" responses.

REFERENCES

1. Ames, A. Jr. *An Interpretive Manual*. Princeton Univ. Pr., Princeton, New Jersey, 1955.
2. Engel, E. The role of content in binocular resolution. Amer. J. Psychol., **69**: 87–91, 1956.
3. Imboden, J. B. Brunswik's theory of perception. A. M. A. Arch. Neurol. Psychiat., **77**: 187–192, 1957.
4. Meyer, E., Jacobson, W. E., Edgerton, M. T. and Canter, A. Motivational patterns in patients seeking elective plastic surgery. I. Women who seek rhinoplasty. Psychosom. Med., 1960. In press.
5. Tennessee. Department of Mental Health. *Self-Concept Scale*. Nashville, Tenn., 1956.
6. Welsh, G. S. Factor dimensions A and R. In *Basic Reading on the MMPI in Psychology and Medicine*, Dahlstrom, G., ed., pp. 264–281. Univ. of Minnesota Pr., Minneapolis, 1956.

A COMPARISON OF SPINAL CORD, CORTICAL AND SUPERFICIAL CIRCULATION

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INTRODUCTION

Factors governing the circulation of the blood in the spinal cord have not been investigated as extensively as have those factors influencing circulation in other parts of the body. The infrequent occurrence of clinical entities ascribed to disturbances in the circulation of the spinal cord, and the complexity of this vascular system, which has few well defined vessels of outflow and inflow, have probably inhibited inquiry into this subject. In only a few publications is the vascular physiology of the vessels of the spinal cord compared with that of the rest of the body.

Using a thermocouple, Field *et al.* (16) measured the alteration in the blood flow of the spinal cord caused by anesthesia, carbon dioxide, adrenalin, asphyxia and curare, and reported that blood pressure changes may produce passive changes in the blood flow of the cord in debilitated animals. In healthy animals, however, the blood flow of the cord was almost independent of changes in the systemic blood pressure. Vasodilation in localized regions of the cord was observed after peripheral nerve stimulation, but occasionally pronounced vasoconstriction also occurred. Adrenalin was found to have a vasoconstrictor action, and in this respect the response of the blood vessels in the spinal cord is similar to both the cutaneous and visceral vessels.

Blau *et al.* (3), using an India ink injection method, noted an increase in the number and size of visible blood vessels in a localized ipsilateral region of the cord after exercising a single hind limb.

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The present study is an attempt to determine some of the factors influencing circulation in the spinal cord. Alterations of the pial circulation of the spinal cord and of the circulation in the rest of the body, particularly the pial circulation of the brain, have been observed following the administration of various drugs and after other procedures. Visual observations of the blood vessels have been supplemented by polarographic measurements of the oxygen tension of tissues in the same areas.

METHODS AND MATERIALS

A total of 120 dogs were used in these experiments. Direct observation was made on 80 animals. Fifty animals were employed for polarographic study. All animals were anesthetized with intravenous nembutal (25 mgm./kilo). Laminectomy was performed between T 13 and L 3. The spines of the vertebrae above and below the exposed area were used to suspend the animal above the table. Under these conditions, the respiratory movements did not affect the observations. The direct observations were made through a dissecting microscope with a micrometer eyepiece. The dura was opened and the exposed cord was covered with a layer of mineral oil. Since the pattern of the blood vessels on the dorsal surface of the cord is quite variable, it was not always possible to make observations in the same segment in all animals. Blood pressure measurements were obtained from the femoral or the common carotid artery using a Stratham pressure transducer (Type P 23Gb.), and occasionally with a mercury manometer. The femoral and jugular veins of the opposite side were used for injection of various drugs. In some animals the common carotid artery on one side was ligated for approxi-

mately 30 minutes during the observations. In other animals the abdominal aorta was ligated immediately above the origin of the celiac artery for about 20 minutes. Occasionally, attempts were made to produce spasm by stimulating the larger pial vessels (200 μ in diameter) in the spinal cord and cerebral cortex with local application of acid (0.5–2.0% HC), with gentle pressure, and with pricks by hot and cold needles. Polarographic studies were made using a glass insulated open-type platinum electrode as the oxygen cathode, in a manner similar to that described by Davies and Brink (11). The indifferent electrode was a silver-silver chloride wire in contact with the exposed muscles near the laminectomy through a salt bridge.

RESULTS AND DISCUSSION

The results of the experiments are summarized on Tables 1, 2 and 3. In general, direct observations revealed a remarkable stability on the part of the cerebral and spinal cord blood vessels. There was no constant alteration in blood vessel diameter except with reduction of the systemic blood pressure to 20 per cent of normal by bleeding. After injection of adrenalin, there was an occasional slight increase in diameter noted in the cerebral blood vessels of 20–50 μ in diameter.

Direct stimulation of the vessels of cord, cortex, and sclera failed to produce vascular spasm in the anesthetized animal. However, following injection of adrenalin or in the presence of blood in the field, spasm at the site of stimulation was occasionally observed in vessels of all diameters, including vessels as small as 20 μ in diameter.

In an anesthetized animal with normal blood pressure, it was not possible to discern the individual blood cells coursing through the vessels by direct observation through the dissecting microscope. After histamine, with a reduction in blood pressure, there was slowing of the blood stream so that individual blood cells became visible. With reductions of blood pressure to 20 per cent of normal, the blood flow ceased completely in some of the smaller vessels of the cord and cortex.

When the blood pressure was elevated by the injection of adrenalin, there was a general increase in blood flow; in a few of the smaller (50 μ) vessels in the cord and cortex there was noted occasionally some slowing of blood flow with clumping of the red blood cells. The sclera and conjuctiva exhibited a prompt but very brief pallor after adrenalin, lasting only a few seconds. The smaller vessels there, also, showed slowing of the blood flow with clumping of red blood cells. Blood flow was also slowed in the cortical vessels following ligation of the carotid vessels and in the cord vessels after ligation of the abdominal aorta. When local spasm could be produced, there was slowing of blood flow distal to the area of spasm.

The polarographic observations on the oxygen availability of the cord and cortex indicated a close correlation between it and the systemic blood pressure (Figure 1). Histamine produced a drop in blood pressure and oxygen availability (Figure 2). The converse occurred with adrenalin. In general, priscoline produced a slight elevation of blood pressure and oxygen availability but occasionally the opposite effect was noted. In almost all experiments ATP produced an elevation of oxygen availability with an accompanying drop in blood pressure (Figure 3). In the sclera, the oxygen availability also varied with the blood pressure, but in the opposite direction, being reduced with adrenalin and increase with histamine.

The observation made in this study may differ from what actually occurs in the intact animal, since our observations were made on exposed tissue covered only by a film of mineral oil. However, at present we have no reason to believe that the results obtained are far different from the normal physiological responses, at least as far as comparison of relative responses in different tissues under the same circumstances are concerned.

TABLE 1

Results of Direct Observation of the Vessels on the Dorsal Surface of the Spinal Cord

Drugs	Dose I.V. mgm./kgm. body wt.	B.P. Change	Change in Vessel Diameter	Change in Velocity of Blood Flow	Number of Trials	Number of Animals
Adrenalin	0.05–0.3	Increased by 160% for 1–3 min.	None	Increased in most small vessels (20–40 μ). In a few vessels slowing was noted.	50	27
Adrenalin	(Applied locally)	None	None	None	3	3
Histamine HPO_3	0.04–0.275	Reduced 50% 1–3 min.	None	Decreased for 0.5–1 min.	45	25
Priscoline	2–5	Increased by 10% for 10–30 min.	None	None	15	10
ATP	2–3	Reduced by 40% for 0.5–1 min.	None	None	7	3
Aminophylline	3–12	Reduced by 5–10% for 10–30 min.	None	None	7	5
Procaine HCl	1% Locally	None	None	None	6	6
Atropine	0.04	Reduced by 20% for 0.5–1 min.	None	None	10	6
Prostigmine	0.05	Increased by 10–20% 0.5–1 min.	None	None	4	2
Cortisone	25 (IM)	None	None	None	1	1
Other Procedures						
Bleeding		Reduced by 10–75%	None	Reduced in all vessels. Arrested in a few small vessels	2	2
Bleeding		Reduced by 80% or more	Reduced by 10%	Reduced markedly with arrest in many vessels of less than 50 μ diameter	2	2
Ligation of abdominal aorta for 20 min.		Elevated 20–40%	None	Reduced in some of the small vessels (less than 50 μ in diameter)	3	3

The oxygen electrode becomes progressively less sensitive when the tip is exposed to tissue fluids. However, this factor did not appear to be important in the present study, since each electrode was tested for sensitivity before and after each experiment. Inch (26) has indicated that this desensitization is slow and quite small and of little significance

TABLE 2

Results of Direct Observation of Pial Vessels of Parietal Cortex

Procedure	B.P. Change	Change in Vessel	Caliber Change in Velocity of Blood Flow	Number of Trials	Number of Animals
Ligation of both common carotid arteries	None	None	Reduced	2	2
Ligation of ipsilateral common carotid artery	None	None	None	3	2
Injection I.V. of adrenalin 0.05–0.3 mgm./kgm. body wt.	Increased to 2 × normal for 1–3 min.	None	Increased in most vessels of 20–40 micra. Reduced in a few for 1–3 min.	35	14
Injection I.V. histamine HPO_3 0.09–0.275 mgm./kgm. body wt.	Reduced to 50% or more of normal for 1–3 min.	None	Decreased in all vessels for 0.5–1 min.	20	12

TABLE 3

Results of Direct Observation of the Vessels of Sclera and Conjunctiva

Drug	Dose I.V. mgm./kgm. bod. wt.	B.P. Change	Change in Vessel Caliber	Change in Velocity of Blood Flow	Number of Trials	Number of Animals
Adrenalin	0.05–0.3	Increased to 2 × normal for 1–3 minutes	Constriction of smaller vessels (20–50μ diameter)	Decreased in smaller vessels (20–50μ diameter)	15	9
Histamine HPO_3	0.04–0.275	Decrease to 50% or less of normal for 1–3 min.	Dilation	Increased	10	9
Priscoline	2	Increased usually by 10% of normal	None	None	2	2

when compared to the observation times and changes in O_2 availability of our experiments. Also, similar electrodes have been chronically implanted in tissue without any reported loss of sensitivity (9). Placing the electrode at some distance from a blood vessel reduced the recorded oxygen availability, as did allowing the electrode to penetrate the surface of the tissues. This is in agreement with observations of Bronk *et al.* (6).

In this study adrenalin was used as a typical vasoconstrictor. This drug has been reported to produce dilation of the pial vessels of the brain and increased cerebral circulation, as noted by direct observation (19), thermocouple measurement (7, 23, 48) and the nitrous oxide method (30). This increase in circulation appears to be due to an increase in systemic blood pressure. Our experiments agreed with these observations, since we saw an increase in oxygen tension indicative of increased blood flow in the spinal cord and cerebral cortex. We observed a decreased flow in the scleral tissues. Field *et al.* (16) have demonstrated a fall in spinal cord temperature, using a thermocouple, with a rise in blood pressure in two rabbits following intravenous adrenalin injection, and an increase in cord temperature in one rabbit. They concluded that adrenalin has a definite vasoconstrictive action on the blood

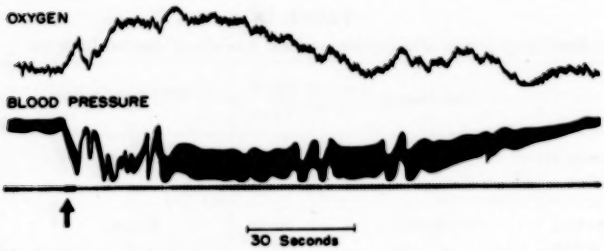

FIG. 1. Blood pressure and polarographic recording from the dorsal surface of the spinal cord demonstrating the close correlation between the two. This record was made after intravenous injection of adrenalin (0.05 mgm./kilo body wt.). The blood pressure elevation is expressed as a downward deflection in this recording and the oxygen availability as an upward deflection with increases in oxygen availability.

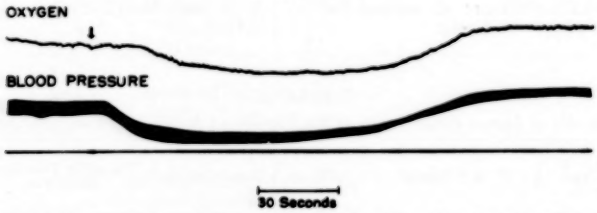

FIG. 2. Blood pressure and polarographic recordings from the dorsal surface of the spinal cord after intravenous injection of histamine acid phosphate (0.275 mgm./kilo body wt.). Decreases in both are recorded as downward deflections on the record.

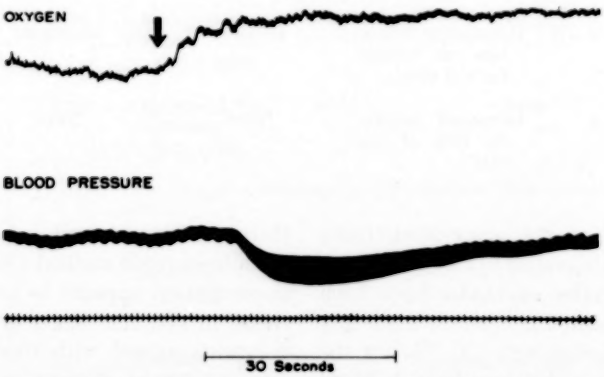

FIG. 3. Blood pressure and polarographic recordings from the dorsal surface of the spinal cord after intravenous injection of ATP (2.0 mgm./kilo body wt.). Increases of both are recorded as upward deflections and decreases as downward deflections.

vessels of the cord similar to its cutaneous visceral vascular reaction. Interpretation of this report is difficult, since the results appear somewhat conflicting and since no blood pressure measurements were made when the spinal cord temperatures were increasing. The weight of the evidence suggests, however, that spinal cord blood flow is increased with adrenalin and that this effect is due to an elevation of systemic blood pressure.

Histamine, papaverine, priscoline, aminophylline, caffeine and ATP all may act as systemic vasodilators. Their actions, however, differ in many respects. Histamine has

TABLE 4

Effect of Drugs on the Oxygen Availability of Dorsal Surface of Spinal Cord

Drug	Dose I.V. mg./kgm. body wt.	Number of Animals Used	Number of Trials with Drug	% Trials Increased O_2	% Trials Decreased O_2	% Trials No Change
Adrenalin	0.05–0.3	30	78	86	6	8
Histamine HPO_3	0.04–0.275	24	39	13	74	13
Priscoline	2.0–5.0	13	20	75	10	15
ATP	2.0–3.0	10	23	87	4	9
Aminophylline	12.0	10	20	5	85	10
Heparin Na	2–5	12	21	57	10	33
Procaine HCl	1–4	13	26	46	12	42
Papaverine HCl	4–32	6	20	80	10	10
Caffein (Sod-Benz)	25–50	7	20	35	35	30
Ethyl Alcohol 50%	0.4–5 cc./kgm.	7	11	36	28	36
Prostigmine	0.05	6	8	37.5	25	37.5
Thiamine	5–20	6	14	43	21	36
Phenobarbital	3–13	5	6	17	0	83

been reported to produce dilation of the small cerebral vessels and facial vessels (52) and an increase in cerebral blood flow. It may also act to decrease cerebral blood flow secondarily to a decrease in blood pressure (39). Additionally, histamine has been reported to produce no alteration in cerebral blood flow (1) or a variable response, dependent on the anesthesia used (21). Schenkin (47) and Kety (29) concluded that histamine acts as a vasodilator directly on the cerebral blood vessels, as it does on the other vessels in the body.

Clark *et al.* (9), using a chronically implanted electrode in the cat brain, noted an immediate drop in oxygen tension lasting a minute, followed by a rise lasting somewhat longer after histamine. In our study histamine decreased the oxygen tension in the spinal cord and brain but increased it in the sclera (Figure 3). In general, it appeared to have little effect on the diameter of the observed blood vessels of the spinal cord or brain. However, some vasoconstriction was noted following intravenous histamine, but this was not seen consistently. We were not able to observe any vasodilation in the cord or brain similar to that in the sclera.

Priscoline has been reported to be of benefit in cerebral vascular diseases (49) and experimental dilation of cerebral vessels by this drug has been reported (5, 15). Scheinberg *et al.* (46) noted a mild vasodilation of cerebral vessels accompanied by hypoxia. In our experiments there was usually a slight increase in oxygen availability of spinal cord tissues when there was a rise in blood pressure following administration of the priscoline. Others have noted elevation of blood pressure by priscoline in the dog and ascribed this to the increased cardiac output necessary to overcome the blood pressure effects of vasodilation (22). Occasionally, we noted a decrease in oxygen availability, but this was always accompanied by a drop in blood pressure indicating a close relation-

TABLE 5

Effect of Drugs on the Oxygen Availability of the Cerebral Cortex

Drug	Dose I.V. mg./kgm. body wt.	Number of Animals	Number of Trials with Drug	% of Trials Increased O_2	% of Trials Decreased O_2	% of Trials No Change
Adrenalin	0.05–0.3	10	45	78	11	11
Histamine HPO_3	0.04–0.275	7	12	17	75	8
Aminophyllin	3.0–12.0	3	9	22	67	11
ATP	2.0–3.0	3	7	86	14	0
Papaverine HCl	4–32.0	2	6	83	0	17
Heparin Na	2.0–5.0	2	4	50	0	50
Priscoline	2.0–5.0	3	6	67	16.5	16.5

ship between oxygen and systemic blood pressure.

Papaverine has been reported to increase cerebral blood flow (25). Its clinical value is said to be due to relief of vasopasm (34, 47, 53). We noted that papaverine usually increased the oxygen availability of the cerebral and spinal cord tissues accompanied by a slight and transient elevation of blood pressure.

Caffeine and aminophylline have been reported to depress cerebral blood flow. Finesinger (17) reported a variable response dependent upon the anesthesia used. In our experiments aminophylline caused a slight decrease in the oxygen availability of the brain and cord accompanied by a slight depression of blood pressure. In some cases a small initial elevation in oxygen tension was observed. The effects of caffeine were variable and no definite conclusion could be drawn.

The effects of most of these drugs on the circulation of either the spinal cord or the cerebral cortex was closely related to the blood pressure, suggestiong that the circulation of the spinal cord passively follows the changes in systemic blood pressure. One exception to this was ATP which almost invariably elevated the oxygen availability, in spite of a drop in blood pressure.

The effects of other drugs, such as heparin, procaine, and alcohol on the circulation of the spinal cord were also studied. The mechanism of action of heparin and other anticoagulants in therapy is not well understood (18). In an experimental study of infarction in monkeys Meyer (37) demonstrated that the anticoagulant drugs prevent an increase in local cerebrovascular resistance and promote better collateral circulation. However, no influence of heparin on the total cerebral blood flow has been noticed (50). An autoradiographic study by Otomo *et al.* (40) on the circulation of the spinal cord showed favorable changes in disturbed circulation following the administration of heparin. We observed a small increase in oxygen availability in more than half of the animals, occurring almost immediately after administration of heparin. This was not accompanied by any detectable change in blood pressure. Pool *et al.* (43) noted a local vasodilation caused by procaine applied locally to the larger arteries of the brain, such as vessels of the circle of Willis. However, in the present studies, local administration of procaine failed to affect oxygen availability consistently and had no effect on the blood pressure. The cerebral blood flow is said not to be affected significantly by moderate amounts of alcohol (2), which agrees with our results in the spinal cord.

The observation of the increase and decrease in velocity of the blood flow of smaller vessels without any significant change in diameter of the vessels noted after injection of adrenalin and histamine, respectively, agreed with the polarographic measurements, and indicates the importance of the velocity of the blood flow in the local circulation in maintaining the oxygen supply. Throughout these experiments the blood vessel diameters in cord and cortex remained remarkably stable despite variations in blood pressure, oxygen availability, and blood flow. Although some changes in caliber were noted, they were inconsistent and appeared to reflect only the grossest alterations in the blood pressure. Dilation was occasionally noted with elevation of pressure and constriction with decreased pressure.

The direct observations of the cerebral circulation by others have shown that the cerebral vessels are more resistant to changes than those of the rest of the body. Echlin (13) observed changes in the diameter of the pial vessels of the cerebral cortex in cat, dog, and monkey with direct stimulation, while Rothenberg *et al.* (45) failed to produce any change in diameter by similar mechanical stimulation in monkeys, although they observed changes in the diameter when the blood pressure was elevated. This is consistent with our occasional observation of spasm caused by direct stimulation after adminis-

stering adrenalin. A cinephotomicrographic study by Gurdjian *et al.* (24) in the monkey failed to show any change in diameter of the pial vessels by direct stimulation or by stimulation of various nerves. Echlin (13) has suggested that the effect of mechanical and electrical stimulation on the pial vessels varies with the species. It is greatest in the cat, less in the dog, and least in the monkey. McLaurin *et al.* (35), using polarographic techniques, have demonstrated in dogs a similar lack of compensatory mechanisms for maintaining cerebral blood flow during hypotension induced by exsanguination and autonomic blockade. These workers were inclined to believe that this was due to the depth of anesthesia. A similar conclusion has been reached by Ingvar and Söderberg (27), who noted a lack of compensatory mechanisms with deep anesthesia but the presence of such mechanisms in light anesthesia.

It is possible that in the present experiments the apparent close correlation between blood pressure and cerebral and spinal cord blood flow without any apparent compensatory alterations in vessel caliber is due to anesthesia. However, it is apparent that if this is the case, then the scleral circulation responds differently to anesthesia than does the central nervous system circulation, since vigorous dilation and constriction still are present during anesthesia. This suggests strongly that the control mechanisms of central nervous system circulation are different from those of the more peripheral circulation. Precisely what factors are present which determine this difference in response is not clear. It is possible that this difference is related to the degree of autonomic control of the blood vessels.

It is generally known that vasomotor regulation in the brain differs from that in other organs. Vasomotor nerves have been demonstrated and the vasodilator mechanism has been described (8, 10, 20, 36). In spite of the reports of beneficial effects from stellate ganglion block (31, 44) in treatment of cerebral vascular diseases, this procedure did not change either cerebral blood flow (25) or the resting cerebral oxygen availability (38). Stimulation of cerebral sympathetic nerves has no effect on the diameter of the pial vessels (24), cerebral blood flow (24, 33) or resting cerebral oxygen availability (38). In the spinal cord the anatomical existence of vasomotor nerves has not been settled.

The question of the occurrence of vasospasm in vessels of the central nervous system is one on which there is not entire agreement. Pickering (41, 42) argued against vasospasm as the mechanism of transient hypertensive crisis, stating that similar transient syndromes can be produced clinically by an obstruction such as a cerebral embolism. Denny-Brown (12) suggested that chronic carotid occlusion could cause transient cerebral attacks without vasospasm. However, in the large arteries of the brain, active vasospasm has been observed clinically (1, 4, 21, 32), angiographically (14, 43), and experimentally (43) in man. Pool *et al.* (43) produced visible vasoconstriction which was reversed by local administration of 2 per cent procaine or 3 per cent papaverine in the branches of the circle of Willis of the anesthetized cat, dog, and monkey. Walker (51), however, after viewing 800 cerebral angiographies, stated that he was not convinced that there is any spasm of the intracranial arteries. Experimental failure to produce vasospasm of pial vessels by various types of stimulation was reported by Rothenberg *et al.* (45) and Gurdjian *et al.* (24). However, the present experiments suggest that vasospasm of pial vessels does occur under special circumstances.

CONCLUSIONS

The present study indicates that the chief factor controlling blood flow and oxygen tension of the central nervous system in the absence of occlusive vascular disease is the systemic blood pressure. Control of blood flow by changes in diameter of the blood vessels in the 30 to 200 μ range was not observed. The present experiments did not

assess the response of the spinal cord vessels to local occlusion or to increased local neuronal activity, either of which could cause accumulation of metabolites and might produce local changes in blood flow as has been reported for the cerebral circulation. Also, our observations were limited to superficial blood vessels. The relation of capillary activity within the spinal cord tissue and blood flow could not be assessed.

REFERENCES

1. Alman, R. W., Rosenberg, M. and Fazekas, J. F. Effects of histamine on cerebral hemodynamics and metabolism. A. M. A. Arch. Neurol. Psychiat., **67:** 354–356, 1952.
2. Batter, L. L., Heyman, A. and Patterson, J. L. Effects of ethyl alcohol on cerebral blood flow and metabolism. J. A. M. A., **152:** 6–10, 1953.
3. Blau, J. N. and Rushworth, G. Observations on the blood vessels of the spinal cord and their responses to motor activity. Brain, **81:** 354–363, 1958.
4. Botterell, E. H., Lougheed, W. M., Morlsy, T. P. and Vendewater, S. L. Hypothermia in surgical treatment of ruptured intracranial aneurysm. J. Neurosurg., **15:** 4–18, 1958.
5. Bridge, T. J., Clark, K. and Yahr, M. O. Plethysmographic studies of the cerebral circulation: Evidence for cranial nerve vasomotor activity. J. Clin. Invest., **37:** 763–772, 1958.
6. Bronk, D. W., Davies, P. W., Brink, F. and Larrabee, M. G. Oxygen supply and oxygen consumption in the nervous system. Trans. Amer. Neurol. Ass., **70:** 141–144, 1944.
7. Carlyle, A. and Grayson, J. Factors involved in the control of cerebral blood flow. J. Physiol., **133:** 10–30, 1956.
8. Chorobski, J. and Penfield, W. Cerebral vasodilator nerves and their pathway from medulla oblongata. Arch. Neurol. Psychiat., **28:** 1257–1289, 1932.
9. Clark, L. C., Misrahy, G. and Fox, R. P. Chronically implanted polarographic electrodes. J. Appl. Physiol., **13:** 85–91, 1958.
10. Cobb, S. and Finesinger, J. E. Cerebral circulation xix. The vagal pathway of vasodilator impulses. Arch. Neurol. Psychiat., **28:** 1243–1256, 1932.
11. Davies, P. W. and Brink, F., Jr. Direct measurement of brain oxygen concentration with a platinum electrode. Fed. Proc., **1:** 19, 1942.
12. Denny-Brown, D. The treatment of recurrent cerebrovascular symptoms and the question of basospasm. Med. Clin. N. Amer., **35:** 1457–1474, 1951.
13. Echlin, F. A. Vasospasm and focal cerebral ischemia. Arch. Neurol. Psychiat., **47:** 77–96, 1942.
14. Ecker, A. and Riemenschneider, P. Angiographic demonstration of spasm of intracranial arteries with special reference to saccular arterial aneurysm. J. Neurosurg., **8:** 660–667, 1951.
15. Engel, D. Cerebral blood vessels and priscol. Brit. Med. J., **1:** 106, 1952.
16. Field, E. J., Grayson, J. and Roger, A. F. Observations on the blood flow in the spinal cord of the rabbit. J. Physiol., **114:** 56–70, 1951.
17. Finesinger, J. E. Cerebral circulation xviii. Effect of caffeine on cerebral vessels. Arch. Neurol. Psychiat., **28:** 1290–1325, 1932.
18. Fisher, C. M. The use of anticoagulants in cerebral thrombosis. Neurology, **8:** 311–332, 1958.
19. Forbe, H. S., Finley, K. H. and Nason, G. I. Cerebral circulation xxiv. a. Action of epinephrine on pial vessels; b. Action of pituitary response and pitressin on pial vessels; c. Vasomotor response in the pia and in the skin. Arch. Neurol. Psychiat., **30:** 957–979, 1933.
20. Forbe, H. S., Nason, G. I., Cobb, S. and Wortman, R. C. Cerebral circulation xiv. Vasodilation in the pia following stimulation of the geniculate ganglion. Arch. Neurol. Psychiat., **37:** 776–781, 1937.
21. Forbe, H. S., Wolff, H. G. and Cobb, S. The cerebral circulation x. The action of histamine. Amer. J. Physiol., **89:** 266–272, 1929.
22. Friedberg, L., Katz, L. N. and Steinitz, F. S. Effect of drugs on pulmonary and systemic arterial pressures in trained unanesthetized dogs. J. Pharmacol. Exp. Ther., **77:** 80–106, 1943.
23. Gibbs, F. A., Gibbs, E. L. and Lennox, W. G. The cerebral blood flow in man as influenced by adrenaline, caffeine, amylnitrate and histamine. Amer. Heart J., **10:** 916–924, 1935.
24. Gurdjian, E. S., Webster, J. E., Martin, F. A. and Thomas, L. M. Cinephotomicrography of the pial circulation. A. M. A. Arch. Neurol. Psychiat., **80:** 418–435, 1958.
25. Harmel, M. H., Hafkenscheil, J. H., Austin, G. H., Crumpton, C. W. and Kety, S. S. The effect of bilateral stellate ganglion block on the cerebral circulation in normotensive and hypertensive patients. J. Clin. Invest., **28:** 415–418, 1949.
26. Inch, W. R. Problems associated with the use of the exposed platinum electrode for measuring oxygen tension in vivo. Canad. J. Biochem. Physiol., **36:** 1009–1021, 1958.
27. Ingvar, D. H. and Söderberg, U. A new method for measuring cerebral blood flow in relation to the electroencephalogram. Elec-

troenceph. Clin. Neurophysiol., **8:** 403–412, 1956.

28. Jane, H. W., Scheinberg, P., Rich, M. and Belle, M. S. The effect of intravenous papaverine hydrochloride on the cerebral circulation. J. Clin. Invest., **31:** 111–114, 1952.
29. Kety, S. S. Considerations of the effects of pharmacological agents on the over-all circulation and metabolism of the brain. In *Neuropharmacology*, pp. 13–89, Josiah Macy, Jr. Foundation, New York, 1954.
30. King, B. D., Sokoloff, L. and Wechsler, R. L. The effects of l-epinephrine and l-norepinephrine upon cerebral circulation and metabolism in man. J. Clin. Invest., **31:** 85–91, 1958.
31. Leriche, R. Treatment of embolism and thrombosis of the cerebral vessels. Brit. Med. J., **1:** 231–235, 1952.
32. Logue, V. Surgery in spontaneous subarachnoid hemorrhage; operative treatment of aneurysms on anterior cerebral and anterior communicating artery. Brit. Med. J., **1:** 437–497, 1956.
33. Ludwigs, N., Schneider, M. Über den Einfluss des Halssympathicus auf die Gehiendurchblutung. Pflüger Arch. Ges. Physiol., **259:** 43–55, 1954.
34. McCall, M. L., Finch, T. V. and Tayloe, H. W. The cerebral effects of papaverine hydrochloride in toxemia of pregnancy. Amer. J. Obstet. Gynec., **61:** 393–398, 1951.
35. McLaurin, R., Devanney, J. W., Elam, E. B. and Budde, R. B. Studies on cerebral oxygenation during induced hypotension. A. M. A. Arch. Neurol., **1:** 443–451, 1959.
36. McNaughton, F. L. The innervation of the intracranial blood vessels and dural sinuses. Res. Publ. Ass. Res. Nerv. Ment. Dis., **18:** 178–200, 1938.
37. Meyer, J. S. Localized changes in properties of the blood and effects of anticoagulant drugs in experimental cerebral infarction. New Engl. J. Med., **258:** 151–159, 1958.
38. Meyer, J. S., Fang, H. C. and Denny-Brown, D. Polarographic study of cerebral collateral circulation. A. M. A. Arch. Neurol. Psychiat., **72:** 296–312, 1954.
39. Norcross, N. C. Intracranial blood flow. Arch. Neurol. Psychiat., **40:** 291–299, 1938.
40. Otomo, E., Van Buskirk, C. and Workman, J. B. Circulation of the spinal cord studied by autoradiography. Neurology, **10:** 112–122, 1960.
41. Pickering, G. W. Transient cerebral paralysis in hypertension and in cerebral embolism. J. A. M. A., **137:** 423–430, 1948.
42. Pickering, G. W. Vascular spasm. Lancet, **2:** 845–850, 1951.
43. Pool, J. L., Jacobson, S. and Fletcher, T. A. Cerebral vasospasm—clinical and experimental evidence. J. A. M. A., **167:** 1599–1601, 1958.
44. Risteen, W. A. and Volpitto, P. P. Role of stellate ganglion block in certain neurologic disorders. Southern Med. J., **39:** 431–435, 1946.
45. Rothenberg, S. F. and Corday, E. Etiology of the transient cerebral stroke. J. A. M. A., **164:** 2005–2008, 1957.
46. Scheinberg, P., Blackburn, I. and Rich, M. The effects of intravenous Priscoline on cerebral circulation and metabolism. J. Clin. Invest., **32:** 125–129, 1953.
47. Schenkin, H. A. Effects of various drugs upon cerebral circulation and metabolism. J. Appl. Physiol., **3:** 456–471, 1951.
48. Schmidt, C. F. and Hendrix, J. P. The action of chemical substances on cerebral blood vessels. Res. Publ. Ass. Res. Nerv. Ment. Dis., **18:** 229–276, 1938.
49. Smith, S. and Turton, E. C. Restoration of speech in severe aphasia by intravenous and oral priscol. Brit. Med. J., **2:** 891–892, 1951.
50. Talley, R. W. The effect of heparin on the cerebral blood flow of elderly state hospital patients. Amer. J. Med. Sci., **230:** 61–64, 1955.
51. Walker, A. E. In discussion on Perese, D. M., Kite, W. C., Bedell, A. J., Campbell, E.: Complications following cerebral angiograph. A. M. A. Arch. Neurol. Psychiat., **71:** 113–114, 1954.
52. Weiss, S., Robb, G. P. and Ellis, L. B. The systemic effects of histamine in man. Arch. Intern. Med., **49:** 360–396, 1932.
53. Zussek, H. I. and Zohman, B. L. Papaverine in cerebral angiospasm (vascular encephalopathy). J. A. M. A., **136:** 930–932, 1948.

COMPARISON OF THREE PSYCHOTROPIC DRUGS (PSILOCYBIN, JB-329, AND IT-290) IN VOLUNTEER SUBJECTS

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Clinical success with tranquilizers has rekindled interest in psychotomimetic drugs both as research tools and therapeutic agents. Recently, psilocybin and JB-329 ('Ditran') have been added to the list of psychotomimetic agents, though differing in chemical structure and origin. Psilocybin occurs naturally as an active principal of the hallucinogenic mushroom, *Psilocybe mexicana Heim*, while JB-329 is synthetic. Psilocybin has an indolic structure with a phosphoric acid grouping at the 4-position, making it unique among naturally-occurring indoles thus far known. Chemically, it resembles another psychotomimetic, bufotenin, as well as the possible neurohormone, 5-hydroxytryptamine (serotonin). JB-329 consists of two isomers: N-ethyl-2-pyrrolidylmethyl-phenylcyclopentyl glycolate hydrochloride and N-ethyl-3-piperidyl-phenylcyclopentyl glycolate hydrochloride. These compounds have strong central and peripheral anticholinergic effects comparable to atropine. However, the central effects of JB-329 do not appear to be related to cholinergic blockade as administration of anticholinesterase drugs reverses only the peripheral effects. Earlier studies of psilocybin and JB-329 indicated that in humans profound mental effects could be elicited (3, 6, 7, 10).

Having decided to study these two compounds concurrently, we further decided to introduce a comparison drug. For this purpose, we chose IT-290 (dl-alpha-methyltryptamine), the indole analog of amphetamine. Animal pharmacologic studies indicated some amphetamine-like properties, though IT-290 was less toxic and excitant. IT-290 seemed appropriate as a comparison agent because of its chemical relationship to psilocybin and pharmacologic effects mimicking in part those of psychotomimetic agents.

METHOD OF STUDY

Psilocybin was used in 27 trials in 16 subjects. Oral doses ranging from 60 to 209 mcg/K were taken in 18 trials, parenteral doses ranging from 37 to 203 mcg/K were taken in 9 trials. JB-329 was administered in 11 trials in as many subjects. All doses were oral, varying from 40 to 339 mcg/K. IT-290 was administered in eight trials in as many subjects. All doses were oral, ranging from 384 to 810 mcg/K. Seven subjects received one trial of each of the three drugs administered orally in a varying sequence using blind controls. This procedure was done in a special attempt to compare the three agents in the same subjects. These volunteer subjects were mostly graduate students who had been trained to make objective observations and possessed descriptive ability. Their age varied between 22 and 44 years (median 26 years). All were in good general health and had been screened to rule out overt psychiatric disorders. Drugs were administered early in the morning with the subjects fasting.

Trials were conducted on a medical ward of a psychiatric hospital. Subjects were placed in a private room, small and austerely furnished. To minimize the effects of external

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influence, subjects were visited by hospital personnel only for obtaining clinical or laboratory data. For the first 90 minutes of each trial, these interruptions were minimal.

Three parameters were studied, as follows.

Clinical Measures. Each subject was provided with a tape recorder for verbal recording of subjective experiences. Time cues were provided so that the onset and duration of each reported symptom could be recorded. Each tape was carefully reviewed to transcribe a chronologic log. Following the trial, each subject completed a questionnaire of 43 questions. Twenty-five of these were questions most frequently answered positively in a questionnaire previously used in studies of psychotomimetic drugs; 18 questions regarding specific symptoms of psychopathology were derived from another similar questionnaire (1, 8). These two sources of data were combined to establish the full clinical syndrome experienced. Prior to each trial, measures were taken of blood pressure, pulse rate, pupillary size, deep tendon reflexes, and simple coordination tests (finger-nose, heel-knee, Romberg test). These tests were repeated approximately two hours after taking psilocybin and IT-290 and approximately four hours after taking JB-329.

Biochemical Measures. Prior to administering each drug, blood was drawn for determination of fasting total eosinophil count, serum cholesterol, alkaline phosphatase and cholinesterase activity and serum glutamic oxalacetic transaminase (SGO-T) titer. These measures were repeated two hours later in the case of psilocybin and IT-290 and four hours later in the case of JB-329. A baseline electroencephalogram was also obtained, being repeated one and one-half to two hours after psilocybin and IT-290 and three and one-half to four hours after JB-329. A control urine sample was collected for determinations of total inorganic phosphorus and creatinine excretion. All urine voided during the first two hours of the trials with psilocybin and IT-290 and during the first four hours with JB-329 was collected for the same determinations.

Psychometric Tests. Two measures of mental function were used. One consisted of a series of simple arithmetic problems (Number Facility Test). The other consisted of linear drawings, each comprising four lines which had to be copied from a completed drawing (Flexibility of Closure) (9). Subjects were also tested for ability to estimate varying periods of time (5, 15, 30, and 60 seconds). Each of these tests were administered prior to each drug trial and hourly for four hours after drug administration.

RESULTS OF STUDY

Clinical Syndrome

The clinical syndromes from each of the three drugs are shown in Table 1. Despite the fact that these agents produced many symptoms and signs in common, the total clinical syndrome from each drug was distinctly different. The onset of action of psilocybin was fairly prompt, usually within 30 minutes, and the total duration of action was comparatively brief, usually having subsided after four hours. The predominant mental symptoms of the drug were an initial feeling of anxiety and tension, later succeeded by euphoria and a dreamy, introspective state with only slight loss of mental functions and ability to communicate. Visual effects were also predominant, beginning with blurring and increased definition of objects, proceeding to the illusion of apparent motion of objects or surfaces, and culminating in visions of a variety of colored patterns and shapes, generally pleasing, sometimes frightening, most often seen with the eyes closed but occasionally superimposed upon objects in the field of vision. The psilocybin experience was generally described as pleasant and conductive to insights, although the latter were particularly difficult to describe or document.

With IT-290, onset was slower than with

TABLE 1

Comparison of Clinical Syndromes From Psilocybin, IT-290 and JB-329

Psilocybin	IT-290	JB-329
0–30 Minutes	*0–30 Minutes*	*0–30 Minutes*
Dizzy, giddy	Euphoria	Dizzy, poor coordination
Nausea, abdominal discomfort	Nausea, heartburn	Nausea, dry throat, heartburn
Weakness, muscle aches and twitches, shivering	Yawning, drowsiness	Loss concentration, poor memory
Anxiety, restlessness		Blurred vision, decreased distance perception
Numbness of lips		Difficulty breathing
30–60 Minutes	*30–120 Minutes*	*30–120 Minutes*
Visual effects (blurring, brighter colors, sharper outlines, longer after-images, visual patterns with eyes closed)	Nausea, retching	Brighter colors, sharper outlines
Increased hearing	Dizzy, unsteady	Slurred, blocked, incoherent speech
Yawning, tearing, sweating, facial flushing	Euphoria, restlessness, jittery	Time sense distorted
Decreased concentration and attention, slow thinking, feelings of unreality, depersonalization, dreamy state	Yawning, lethargy	Body-image distorted
Incoordination, tremulous speech	Decreased concentration, silly, inappropriate smiling	Disorientation, confusion, memory loss
		Muscle spasms
60–120 Minutes	*120–240 Minutes*	*120–240 Minutes*
Increased visual effects (colored patterns and shapes, mostly with eyes closed)	Visual effects (blurring, apparent movement of objects, sharper outlines, brighter colors, longer after-images, decreased depth perception)	Confusion, speech disorders continue
Wave-motion of viewed surfaces	"Drunk", euphoria, poor coordination	Apparent motion of objects, wave-like motion of surfaces
Impaired distance perception	Tremors, numbness of extremities	Decreased appetite
Euphoria, ruminative state, increased perception	*4–12 Hours*	Tension, tremors, anxiety
Slowed passage of time	Visual effects (patterns, eyes closed)	Weakness, lethargy, dreamy state
120–240 Minutes	Muscle aching, shivering	Coughing
Waning and nearly complete resolution of above effects	Decreased appetite	Mood change (usually depression)
	Weakness, lethargy	*4–12 Hours*
4–12 Hours	*Later Effects*	Some waning of above effects, if dose small; otherwise may persist
Usually normal	Continued stimulation, insomnia, fatigue, muscle aching, headache, heartburn, "hangover"	*Later Effects*
Later Effects	*Less Common Effects*	Fatigue, lethargy, mental depression, poor coordination, dizziness, poor appetite, tremors
Headache, fatigue, contemplative state	General malaise, salivation increased, paresthesia, dreamy state, mild depersonalization	*Less Common Effects*
Less Common Effects		Depersonalization, visual or auditory hallucinations
Uncontrollable laughter, paresthesia and synesthesia, difficulty in breathing, decreased appetite, transient sexual feelings		

psilocybin and effects were longer, sometimes lasting over a 16 to 18-hour period. Direct stimulation was greater than with psilocybin, early symptoms of jitteriness, restlessness, and anxiety being more pronounced. The visual effects, not often present, were slight. Mental function was little impaired. Somatic symptoms were greater in number and

TABLE 2

Clinical and Biochemical Measures During Trials With Psilocybin, IT-290 and JB-329

Measure	Psilocybin 27 trials	IT-290 8 trials	JB-329 11 trials
Blood pressure	3 elevated	1 elevated	1 elevated
Pulse rate	No change	1 elevated	1 elevated
Pupils	Dilated 24, ave. 3 mm.	Dilated 8, ave. 3 mm.	Dilated 11, ave. 3 mm.
Reflexes	Increased in 19	Increased in 7	Increased in 9
Coordination tests	? pos. Romberg 13	? pos. Romberg 2	? pos. Romberg 5
Urine mgP/mg creatinine	Decreased ($p < 0.05$)	n.s.d.*	n.s.d.
Total eosinophil count	Decreased ($p < 0.05$)	n.s.d.	Decreased ($p < 0.05$)
Serum glutamic oxalacetic transaminase	n.s.d.	n.s.d.	n.s.d.
Serum pseudocholinesterase	n.s.d.	n.s.d.	n.s.d.
Serum alkaline phosphatase	n.s.d.	n.s.d.	n.s.d.
Serum cholesterol	n.s.d.	n.s.d.	n.s.d.
Electroencephalogram	No change	No change	No change

* n.s.d.: no significant difference ($p > 0.05$)

degree than with psilocybin, many subjects complaining of feeling ill for various reasons. With lower doses, these effects could be moderated without changing the general effect of the drug on mood. Except for the somatic effects, the drug experience was considered to be pleasant, though not as meaningful as with psilocybin.

The syndrome produced by JB-329 was considerably different from either other drug. Onset of action of this drug was rapid and effects prolonged. With any sizeable doses of the drug, subjects were generally so incapacitated as to require staying in the hospital overnight, much mental confusion persisting through these hours. The clinical syndrome more clearly resembled a toxic delirium, especially similar to that produced in the past by scopolamine (4). Mental confusion, disorientation, memory loss and marked impairment of speech were predominant features. A characteristic speech pattern was one in which at mid-sentence, a new and irrelevant subject would be introduced into the conversation. From one moment to the next, subjects had difficulty in remembering what they were talking about or what they had just said. Unlike the other two drugs, subjects were somewhat withdrawn, tending not to speak unless spoken to, maintaining a rather perplexed expression. Ideational apraxia was particularly frequent, several subjects attempting to drink from a urinal for collecting urine specimens and one attempting to wash his hands in a toilet bowl. Marked anxiety was also felt, though seldom mentioned until retrospectively. Mood tended to be depressed though less common or severe than the anxiety-provoking effects. On the whole, subjects found JB-329 extremely unpleasant, few considering additional trials of the drug at all. Most had only fragmentary memory for the experience, none describing any positive effects from it.

Clinical and Biochemical Measures

Results of clinical and biochemical measures during the drug trials are summarized in Table 2. Psilocybin significantly elevated blood pressure in three subjects, two having unusually low control blood pressures, and one being a borderline hypertensive. Pulse rate was not changed appreciably in either direction. Dilatation of pupils was almost constantly encountered, averaging 3 mm. over a 2-hour period. Deep tendon reflexes were increased during 19 trials, often becoming clonic in character. Incoordination was more subjective than objective, though sloppiness in coordination tests or swaying on the Romberg test could be detected.

Urinary excretion of inorganic phosphorus and total circulating eosinophils were both significantly reduced. No remarkable changes were noted in the SGO-T titer, serum cholesterol, serum cholinesterase, serum alkaline phosphatase, or electroencephalogram.

IT-290 increased blood pressure and pulse rate beyond physiologic limits in one subject who received the largest dose of the drug and was the oldest subject in the series. Dilatation of the pupils was constant, averaging 3 mm. over a 2-hour period. Deep tendon reflexes were increased in seven trials. Impairment of coordination tests was noted in two subjects. No changes were noted in the remaining biochemical tests nor on the electroencephalograms, though a decrease in total circulating eosinophils just missed statistical significance.

JB-329 increased blood pressure and pulse rate in one subject who had received a large dose. Another subject had an elevated pulse rate. Dilatation of the pupils was constant, averaging 3 mm. over a 4-hour period. Visual blurring was more frequent and severe with JB-329 than with the others despite similar degrees of pupillary dilatation. Deep tendon reflexes were increased in nine subjects. Coordination tests were impaired in five. The only physiologic measure significantly decreased by JB-329 was the total circulating eosinophil count. The remaining biochemical tests and electroencephalograms were not significantly changed from control values.

Psychometric Tests

Psilocybin administered orally decreased significantly the number of problems completed on the Number Facility test during the first hour, but following this, there were no significant differences. Parenteral psilocybin decreased significantly both the number of lines attempted during the first two hours (on the Flexibility of Closure test) and those correctly drawn during the first hour. The number of problems completed on the Number Facility test was significantly decreased during the first hour after the drug. Time estimates of 5, 15, 30, and 60 seconds were not significantly altered by the drug.

IT-290 produced no significant changes on the Number Facility test, Flexibility of Closure test, or time estimates during the first 4-hour period of drug administration as compared with the control measures. On the Flexibility of Closure tests, both the number of lines attempted and completed correctly showed a progressive increase during the first four hours, but failed to reach significance.

JB-329 impaired both psychometric tests. The number of problems correctly completed on the Number Facility test was significantly decreased at the third and fourth hours following drug administration. Two of the subjects were unable to complete any correct problems once the drug had been administered. Both the number of lines attempted and correctly completed were decreased on the Flexibility of Closure test but failed to reach significance during each of the four hours. Once again, two subjects were unable to attempt the test at all once the drug took effect. At four hours, the time estimate for 60 seconds was significantly shortened.

Chronic Administration of JB-329

In a previous report, tolerance to psilocybin was produced by chronic administration in one subject (5). By progressive increase in divided daily doses over a 21-day period, a subject took a large acute dose of the drug (203 mcg/K) with minimal effects. Subsequently, the same dose administered acutely without prior chronic dosage produced a characteristic clinical syndrome.

Another subject agreed to take JB-329 chronically while observed in the hospital. This subject had previously received a 20 mg. dose of the drug (339 mcg/K) which produced a profound clinical syndrome lasting for 24 hours. During the course of chronic administration, he received three divided doses of the drug for 21 days, beginning with a total daily dose of 0.3 mg.

on day 1, increasing to 3 mg. by day 5, 9 mg. by day 9, 18 mg. by day 15, and 27 mg. by day 21. On the 22nd day, he received a single acute dose of 20 mg. as he had received earlier. During the period of chronic administration, he complained within a few days of diminished taste sensation, mild visual blurring, and a slight increase in jitteriness. These complaints did not increase, being constant during the chronic trial. Otherwise, he was able to function normally with mental, speech, and motor functions unimpaired. Following the acute dose of 20 mg. on the 22nd day, he experienced no additional symptoms from what he had previously reported. In fact, he said that on this particular day he had less symptoms than for several days preceding, the latter being days when his total dose exceeded that of the single acute dose. Chronic administration of JB-329, as with psilocybin, apparently leads to tolerance for many of somatic and mental effects of this agent.

DISCUSSION

The two drugs resembling each other most were those chemically similar. Even so, distinct differences were noted between psilocybin and IT-290. Psilocybin resembled LSD-25 and can be properly classified as a psychotometic agent. The clinical syndrome from psilocybin could also have been produced by LSD-25 with a few differences. Psilocybin evoked a dreamy, introspective state at dose levels which did not produce predominant somatic effects nor marked impairment of mental functions. The total span of action was also briefer than with LSD-25 and the whole effect was more agreeable.

IT-290 had a mood-elevating effect similar to but stronger than dextroamphetamine. A peculiar mixture of other effects was also noted. Most patients complained of yawning, dreaminess, and lethargy, despite the fact that mental functions were not impaired. This aspect of the drug, as well as some of its somatic effects, was reminiscent of reserpine. Some of the visual effects resembled those from LSD-25 though less frequent and much milder. The long duration of action of IT-290 as compared with psilocybin may be due in part to the larger dose used.

JB-329 differed substantially from other psychotomimetic agents such as psilocybin, LSD-25, and mescaline. It produces a toxic delirium analogous to that from scopolamine or other belladonna alkaloids. The mental confusion, disorientation, memory loss, and fluctuating level of awareness represent an organic picture differing considerably from usual clinical manifestation of schizophrenic reactions. The long duration and marked impairment makes it imperative that JB-329 be used only in hospitalized patients.

Few biochemical abnormalities were noted from the drugs. Reduction in total circulating eosinophils from psilocybin and JB-329 might be nonspecific as other pharmacologic actions of these two agents are quite different. Effects on electroencephalograms were negligible, at least as observed by usual clinical interpretative techniques. The effects of these drugs on mental functions as measured by the psychometric tests showed clear differences. Psilocybin impaired motivation more than performance as the ratio of correct responses to line drawings attempted remained constant even though the number attempted was reduced. On the other hand, JB-329 decreased not only the attempts but the ratio of correct responses, suggesting impaired performance. With IT-290, confidence was increased with more drawings being attempted, although the ratio done correctly remained constant.

Each of these three drugs may prove to have therapeutic usefulness. Psilocybin has already been used for facilitating psychotherapy (2). IT-290 may be useful in similar fashion as well as an antidepressant. JB-329 has been recommended as an antidepressant. This drug might also be a useful agent for the experimental determination of delirium thresholds.

SUMMARY

Three new psychotropic drugs, psilocybin, IT-290 (dl-alpha-methyltryptamine) and JB-329 ('Ditran') were compared in volunteer subjects.

Psilocybin resembled lysergic acid diethylamide (LSD-25), producing a clinical syndrome of anxiety, euphoria, introspection and visual effects lasting about four hours. IT-290 more closely resembled amphetamine in producing mood elevation and reserpine in producing somatic effects. Effects of large acute doses persisted for 12 or more hours. JB-329 resembled scopolamine, producing a toxic delirium lasting 12 to 24 hours.

Total circulating eosinophils were significantly reduced by both psilocybin and JB-329. Psilocybin also reduced urinary excretion of inorganic phosphorus. IT-290 had no effect on either of these biochemical tests. None of the other tests measured (serum alkaline phosphatase, serum pseudocholinesterase and serum glutamic oxalacetic transaminase activity, or serum cholesterol) were altered by either drug. Electroencephalographic tracings showed no clinically detectable changes.

Psychometric tests revealed a decrement from psilocybin suggesting decreased motivation. A larger impairment from JB-329 was attributed to dereased performance. IT-290 did not change the tests significantly, though tending to increase both motivation and performance.

Chronic administration of JB-329 leads to tolerance.

REFERENCES

1. Abramson, H., Jarvik, M. E., Kaufman, M. R., Kornetsky, C., Levine, A. and Wagner, M. Lysergic acid diethylamide (LSD-25): I. Physiological and perceptual responses. J. Psychol., **39**: 3–60, 1955.
2. Delay, J., Pichot, P., Lempérière, T. and Quetin, A. Therapeutic effect of psilocybin in a case of compulsive neurosis. Ann. Medicopsychol., **117**: 509–515, 1959.
3. Delay, J., Pichot, P., Lempérière, T., Nicolas-Charles, P. and Quetin, A. Somatic effects of psilocybin. Psychic effects of psilocybin. Ann. Medicopsychol., **117**: 891–907, 1959.
4. Goodman, L. S. and Gilman, A. *The Pharmacologic Basis of Therapeutics*, p. 553. Macmillan, New York, 1955.
5. Hollister, L. E. Clinical, biochemical and psychologic effects of psilocybin. In press.
6. Isbell, H. Comparison of the reactions produced by psilocybin and LSD-25 in man. Psychopharmacologia, **1**: 29–38, 1959.
7. Malitz, S., Escouer, H., Wilkens, B. and Hoch, P. H. Some observations on psilocybin, a new hallucinogen, in volunteer subjects. Comprehensive Psychiat., **1**: 8–17, 1960.
8. Malitz, S., Wilkens, B., Glusman, M. and Hoch, P. H. Comparative study of blocking agents in model psychoses. In *Psychopharmacology*, Pennes, H., ed., p. 226. Hoeber-Harper, New York, 1958.
9. Moran, L. J. *Repetitive Psychometric Measures*. Hogg Foundation for Mental Health, Univ. of Texas, Austin, 1959.
10. Ostfeld, A. M., Abood, L. G. and Marcus, O. A. Studies with ceruloplasmin and a new hallucinogen. A. M. A. Arch. Neurol. Psychiat., **79**: 317–322, 1958.

UNEXPLAINED DEATHS DURING CHLORPROMAZINE THERAPY

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In the literature on fatalities associated with Phenothiazine, there is wide range insofar as to how definitely established is the casual connection between the death and the drug. At one end of the range, there are cases of agranulocytosis and at the other are those deaths which were poorly explained and seemingly happened to occur in a patient receiving the drug.

This is a report on five patients who died unexpectedly, and who happened to be receiving Chlorpromazine. The cases are of interest because of certain features common to all five, and because the causes of death are not satisfactorily explained by autopsy or by the hypothesis regarding similar deaths found in the literature on phenothiazines.

CASE REPORTS

CASE 1

The patient, a single Negro, was admitted to the hospital in 1948 at the age of 25. The premorbid history revealed no conspicuous physical or emotional abnormalities. He had successfully completed four years of Navy duty in December, 1946. Following service, he lost interest in his friends, developed ideas of reference, particularly in regard to his race, experienced auditory hallucinations and became increasingly antagonistic. At the time of admission, and frequently over 10 years of hospital confinement, he was markedly and unpredictably assaultive, delusional, and hallucinated.

A course of insulin and ECT resulted in temporary minimal improvement. In June, 1950, a prefrontal lobotomy was performed, and in July, 1953, another lobotomy was done, making a more posterior cut. The second lobotomy was followed by a year of decreased assaultiveness and increased sociability of a primitive sort.

In the fall of 1954, the patient had the first of a number of grand mal seizures and was placed on Dilantin and Mebaral. EEG revealed bifrontal dysrhythmia and a seizure spike focus in the anterior left hemisphere. Also in 1954, and unrelated to the seizures, the patient became frequently incontinent for urine and feces, a condition that continued until his death.

For six months in 1955, he received Reserpine in doses of 6 mgm. daily.

During 1956 and 1957, he received Chlorpromazine, 300 to 800 mgm. daily, and in addition, 14 mgm. Reserpine daily for a short period. For a short time in 1956 Promazine (Sparine) was substituted for Chlorpromazine in doses up to 3200 mgm. daily, but was stopped because of a sudden increase in convulsions. In October, 1957, Chlorpromazine was stopped and Meprobamate, 400 mgm. q.i.d. was started and continued until April 14, 1958. On April 15, Chlorpromazine was started, 25 mgm. t.i.d. That evening the patient was fairly quiet, but otherwise not remarkable; he got up several times during the night, which was his custom. At 6:00 A.M. the patient was found dead in bed.

Over the period of his hospitalization, the patient had shown a progressive deterioration; drugs had done little more than reduce his assaultiveness. For a year or two before death, he had been mute except for one word, "cigarettes." He was incontinent and required spoon feeding. His main contact with others was by hitting or vigorous hand shaking, accompanied by an explosive hissing laugh, body-shaking and head-nodding.

Over the past six years he had experienced episodes of chills which were not always explained, except on two occasions, when x-rays revealed acute pneumonitis. He showed

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no untoward reactions to drugs except the increase in convulsions with Sparine, and on one occasion ataxia which was relieved by lowering the Mebaral dosage.

CASE 2

The patient, a 32-year-old white, married business manager, was admitted to the hospital on June 19, 1957. He felt depressed and experienced episodes of severe anxiety, accompanied by confusion and profuse perspiration. Physical history was not remarkable except for a paralysis of the left arm following a gunshot wound while in the army in 1947. In spite of severe feelings of inferiority, he had been able to attend business college and attain a supervisory position with his company.

At the time of admission, his physical examination was negative, except for his left arm, and the suspicion of hyperthyroidism was ruled out by a BMR of plus 11, and a protein bound iodine of 9.2 micrograms per cent.

The patient had a stormy hospital course from the beginning, characterized by sudden changes from rational calm to states of panic, self-condemnatory delusions, and unpredictable assaultiveness. Following an assault on another patient ten days after admission, 50 mgm. Chlorpromazine IM every six hours was started, and later replaced by 500 mgm. orally. No hypotensive or other adverse reaction to the drug was noted at this time, or during any of the subsequent courses of Chlorpromazine. The patient's apparent improvement was dramatic. However, on July 31 he unexpectedly attempted suicide by jumping into a vat of hot tar, and as a result sustained second and third degree burns of his lower extremities, which were treated by skin grafts. Following the suicidal attempt, he became overtly psychotic again, but gradually improved over the next four months. Chlorpromazine, 600 mgm. with the addition of 2 mgm. Reserpine, was given throughout this period and did not seem to complicate the several operations and dressing changes performed under general anesthetic.

By December, 1957, he appeared improved enough to visit home, but returned in one day, preoccupied, tense, depressed and confused. He continued thus distrubed until he was operated on for a bladder stone on January 28, 1958.

Three days before the cystotomy, Chlorpromazine and Reserpine were discontinued in preparation for the surgery. He made an uneventful recovery and was up and about by February 7. Tranquilizing drugs were not resumed because the patient was calmer and more rational, although guarded. On the morning of February 15, the patient became acutely disturbed. He was hyper-alert, appeared frightened, attempted to force his way out of the ward, assaulted personnel, and expressed the conviction that he was going to die.

Four IM doses of 50 mgm. Chlorpormazine and 50 mgm. orally were given over a 10-hour period, with a fall in blood pressure from 160/80 to 120/70. By 7:00 P.M. the acute disturbance had subsided, though the patient was still restless, and appeared pale and tired. An hour later he complained of feeling "groggy" and lay down in bed. At 9:00 P.M. he was found dead, lying on his abdomen, his face cyanotic. Personnel within hearing distance had heard no signs of struggling or coughing.

CASE 3

This patient, a white, single male, 44 years old at the time he expired, had been hospitalized continuously for nine years. His premorbid history was not remarkable. He had been in service for six years, attaining the rank of Staff Sergeant. One brother was reported to have had a brief psychotic episode.

The patient showed typical catatonic symptoms, with muteness, negativism, and occasionally stupor. Eye-blinking, trembling, grimacing and rigid postures were also seen. Throughout hospitalization he was

subject to "spells" during which he would perspire, become rigid, tremble violently, and get red-faced; these seemed to be related to anger in that they sometimes preceded his being assaultive. The spells would be accompanied by marked fluctuations in pulse and blood pressure, *e.g.* up to 190/120 from a normal of 120/70.

He had two courses of ECT preceding admission and a full course of insulin coma with combined ECT shortly after admission in 1950. Additional ECT was given intermittantly until the advent of tranquilizers, and was always accompanied by improvement lasting only about two weeks. Altogether, he had over 100 ECT's. EEG's recorded in 1950 and 1953 were reported as normal. In 1952 he showed a suggestive diabetic curve on the three-hour glucose tolerance test.

In 1955 and 1956 alternating trials on Reserpine, 2 mgm. to 4 mgm. daily and Chlorpromazine, 200 mgm. daily proved Reserpine to be the more effective in diminishing the catatonic symptoms. However, after four months of Reserpine the drug was stopped because of side effects in the form of weak sweaty spells, flaccidity, engorged conjunctiva, edema of eyelids, and on one occasion, marked hypotension.

After this, no drug was given for eight months because of concern about what is referred to in the records as "the patient's unstable autonomic system." The patient again withdrew and the spells of violent shaking and flushing increased in frequency. When the patient lost weight and required tube feeding, Chlorpromazine, 200 mgm. daily with Dexedrine, 15 mgm. to support the blood pressure was started in May, 1957, with moderate benefit. The patient continued withdrawn, but fed himself and was passively cooperative; the episodes of shaking and profuse perspiration continued to occur. Dexedrine was finally discontinued without ill effects in August, 1958. From June, 1958, until his death in April, 1959, Chlorpromazine was continued and the patient was approachable and able to participate in the ward activities. On March 26, 1959, Trifluoperazine, 2 mgm. later raised to 5 mgm. daily was added to the maintainance dose of 75 mgm. Chlorpromazine daily.

About one month later, still on the above drugs, and after an uneventful day, the patient had one of his typical "spells" in the evening; the next morning he was found dead in bed and had apparently been dead for three hours. He was lying on his abdomen and there was a small amount of blood on the pillow.

CASE 4

This patient was a single, white male, 44 years old at the time he expired. He had been continuously hospitalized for 15 years. He was described as being sickly and physically weak, following whooping cough, during childhood. The patient had graduated from high school and worked as a clerk until his first psychotic episode at the age of 25. He recovered and entered military service where, after two years, he was hospitalized again and transferred to the Veterans Administration. Although slight in build, he was described as one of the most assaultive patients in the hospital because of the impulsive unpredictable nature of the attacks.

At first he hallucinated and expressed delusions with a religious content. With continued hospitalization, be became more withdrawn and regressed, showing urinary incontinence, apathy, echolalia and complete irrelevance. These regressed phases alternated with periods of more socially acceptable behavior which were always short-lived until tranquilizing drugs seemed to help prolong them.

He had a course of ECT in 1947 and again in 1953, with temporary benefit. In 1954 prefrontal lobotomy was considered, but deferred pending a trial on Chlorpromazine. He was started on 50 mgm. q.i.d. increased to 75 mgm. q.i.d. until, on the eighth day of

medication, he had a sudden vascular collapse and for a few minutes pulse and blood pressure were unobtainable. Reserpine was substituted for Chlorpromazine, but was given in ineffectively small doses because of a syncopal attack which was attributed to the Reserpine.

In 1956 and 1957 Promazine was tried in doses as high as 1600 mgm. daily without hypotensive reactions. However, the EEG changed from a premedication pattern of normal to one showing diffuse cerebral dysrhythmia with occipital spikes and one grand mal seizure was reported.

After a brief trial on Pacatal, 150 mgm. daily, Chlorpromazine was resumed in November, 1958, and reached a maximum dosage of 600 mgm. daily without hypotensive or parkinsonian side effects. The patient showed enough improvement to be able to engage in a regular activity program and go out weekends with relatives. By June, 1959, the daily maintainance dose of Chlorpromazine was 300 mgm. given in spansule form, which was sufficient to control his assaultiveness.

At 6:30 one morning in July, 1959, while still on Thorazine, after an uneventful preceding day, he was found dead in bed.

It may be of interest to note that this patient's assaultiveness was not always unpredictable, that at times when he was tense, he would ask for restraints or a sedative pack. He had shaking spells resembling chills for years, and not infrequently unexplained attacks of vomiting. One five-hour glucose tolerance test in 1954 revealed a 230 mgm. per cent glucose and 2 plus urine at the first hour sample; other laboratory findings were not remarkable.

CASE 5

This patient, a 40-year-old, married, Negro male, entered the hospital by transfer in December, 1958, with a diagnosis of syphilitic meningoencephalitis, for which he had already received treatment. He was hyperexcitable, irritable, impulsive, and had violent rage reactions in response to minor frustrations.

His past history was not remarkable except that he was discharged after three years of military service in 1945 for a "nervous" condition. He worked regularly as a construction laborer for the next 11 years, until the judgmental defects and emotional instability became manifest.

In 1958 he received a course of penicillin for the syphilis and Chlorpromazine to control the "violent rage reactions" which were described.

At the time of his admission to this hospital, serologic examinations had begun to show the expected improvement. His behavior, however, had not improved and he was placed on Prochlorperazine, 60 mgm. daily, along with Cogentin, 1 mgm. which was contined until April, 1959. At this time, the patient developed what was thought to be a drug reaction to the Prochlorperazine, manifested by giant urticaria, pruritis, leukocytosis and a fever of 103 degrees. Reserpine, 3 mgm. daily, was substituted for the Prochlorperazine with only moderate beneficial effect.

In June, the patient had two convulsive seizures, although his EEG record appeared normal during the same month. Dilantin, 100 mgm. t.i.d. was started and continued until death.

In September, 1959, in an effort to better control the rage reactions, Trifluopromazine, 50 mgm. daily was substituted for the Reserpine with a moderate reduction in the intensity of the emotional upsets. Over the next several months it was possible to encourage more participation in hospital activities.

At 6:30 A.M. one morning in March, 1960, the patient was found dead on the floor beside his bed, face down, He apparently had had a convulsion and bit his tongue.

AUTOPSY FINDINGS

The autopsy findings in these five cases were remarkably similar. The most promi-

nent finding was severe pulmonary congestion and edema. Externally, the lung had a dark reddish-purple congested appearance. When sectioned, a large amount of bloody fluid exuded from the cut surface. Microscopically, the lung showed severe congestion as well as edema, and there were frequent intra-alveolar hemorrhages. There was also, in each case, severe generalized visceral congestion, especially prominent in the spleen and kidneys. In the spleen, congestion frequently approached the point of hemorrhage. In the kidney normal markings were partially obscured by diffuse congestion. The liver was not significantly enlarged by weight, but the cut surface was very bloody, indicating active hyperemia.

Autopsy did not reveal the cause of death, with one possible exception (Case 3) in which there was severe coronary artery disease which, under other circumstances would probably be considered sufficient to cause death. In all other respects, however, the five cases appear similar. One case did show aspirated stomach content within the larynx and trachea, but this was small in amount and such a finding is a very frequent terminal or agonal development. In no case was there evidence of angioneurotic edema of the larynx as would be expected in anaphylactic shock.

In summarizing the autopsy findings of the five cases, the most outstanding features were severe pulmonary congestion and edema with focal pulmonary intra-alveolar hemorrhages, associated also with severe visceral congestion. All of these pathologic changes are generally considered to be agonal or terminal manifestations of some other basic pathologic process. What these basic pathologic processes are, certainly remain obscure in these cases. Pulmonary and visceral congestion are, of course, known to occur in cases of circulatory or respiratory failure; but again, some disease or other process must be present to account for such failure.

DISCUSSION

Sudden and unexpected death without an obvious cause is generally mentioned in pathology textbooks and several papers have been written on the subject. However, in a review of our own autopsy records from the years 1950 through 1959, a total of 810 autopsies, no additional cases were found which were similar to the five cases presented. There were a number of cases of sudden death, but these occurred during the course of other severe diseases and were not necessarily unexpected. There was also another group of 10 or 12 cases in which death did occur suddenly and unexpectedly. However, at autopsy, death was usually adequately explained by finding a bolus of food in the larynx or some other obvious pathology. Three patients died following insulin coma therapy and one patient died of alcoholism with a severe fatty liver, a condition in which sudden death is known to occur.

One very interesting review of sudden and unexpected death was made by Moritz and Zamchek (10) in which they reviewed over 40,000 autopsy protocols received at the Army Institute of Pathology during the years 1942–1946. Of these, there were approximately 1,000 cases of sudden and unexpected death in apparently healthy young soldiers from the ages 18 to 40. The majority of these were found at autopsy to be due to: 1) unsuspected heart disease, chiefly coronary artery disease; 2) intra-cranial hemorrhage, chiefly subarachnoid hemorrhage; 3) meningococcemia; 4) a miscellaneous group, including inflammatory degenerative and neoplastic disease. Of special interest, however, was a group of 140 carefully investigated cases of sudden death which revealed essentially normal post mortem findings. Complete autopsy, frequently with toxicological studies, failed to disclose the cause of death. The most common finding at autopsy in this group was pulmonary edema and congestion, followed next by generalized congestion or viscera.

Thirty-three of the cases showed no pathologic findings. Moritz and Zamchek further noted that in eight of this group, death was preceded by an acute psychotic disturbance manifested by emotional and physical agitation. In 10 cases there was a past history of convulsive seizures suggestive of epilepsy. It is obvious, then, that sudden and unexpected death without demonstrable cause has been occurring all along, and at least in the past, there has been no apparent association with any form of medication.

In a survey of the literature on deaths associated with tranquilizers reported at the Association for Research in Nervous and Mental Disease (12), December, 1957, only six out of the total of 19 deaths autopsied were related in any way to the cardiovascular or respiratory systems. Two of the eight were asphyxia due to strangulation, and two were pneumonitis, thought to follow aspiration of foreign material. The majority of the 19 deaths were explainable either as one of the serious complications of Chlorpromazine administration, such as agranulocytosis or liver disease, or from causes probably unrelated to Chlorpromazine.

Feldman (3) reported a fatality during treatment with a phenothiazine which seemed to be aspiration strangulation, and he suggested that phenothiazines may cause a "catastrophic failure of airway defenses" in some individuals.

Farber (2) reported a similar asphyxial death which occurred following a meal in which there seemed to be failure of the cough reflex.

Jeune (6), writing about infants, warned of the dangers of suppression of the deglutition reflex from Chlorpromazine.

Possibly related to this explanation for asphyxial deaths are the occasional dyskinesias of the tongue and throat muscles during which patients complain of choking sensations and dysphagia (1, 8, 9).

The other chief explanation for the asphyxial deaths associated with phenothiazine drugs was proposed by Hollister (5). Both of his cases had seizure histories and he attributed the deaths to glottal spasm from aspiration of foreign material during the seizure. It was his opinion that asphyxial deaths are probably no more common now than before tranquilizers, but it might be that tranquilizers increase the seizure potential of the brain damaged patient.

In support of this hypothesis, Zlotlow and Paganni (15) reported four sudden asphyxial deaths occurring in patients with lobotomies or convulsive disorders, and viewed the deaths as seizure complications.

The suspicion that the tranquilizing drugs have a tendency to lower resistance to disease has been expressed from time to time. Kline, Barsa and Gosline (7) stated that these patients seem to develop infections more easily and seem to decompensate more easily if a cardiovascular condition is present. Wardell (14), working with mentally retarded patients on tranquilizers, observed what seemed to be a high incidence of pneumonia often appearing without the usual premonitory signs. Renzetti and Padget (11) demonstrated experimentally the depressing action of Chlorpromazine in the respiratory system.

In one case of fatal pulmonary edema attributed to Chlorpromazine, Sheard (13) proposed another theory relating Chlorpromazine to the cause of death. He explained the edema as "a disturbance in the pulmonary capillaries brought about by impairment of the nervous vasomotor control operating either centrally or peripherally."

ANALYSIS OF OUR CASES

Because the first two of our cases died so shortly after starting Chlorpromazine for the second or third time, we were struck by the possibility of an allergic sensitivity.

Pursuing this notion, a questionnaire was sent to other VA Hospitals in June, 1958, to determine if others had made similar observations. The inquiry was answered by 143 VA Hospitals, which included 33 Neuro-

psychiatric Hospitals with a total of 41,000 NP beds. No other hospital reported an unexpected death occurring shortly after restarting Chlorpromazine. However, several hospitals gratuitously reported unexpected and inadequately explained deaths in patients occurring under other circumstances. Of interest to us here are four deaths in epileptic patients on Chlorpromazine attributed to asphyxia occurring during a convulsion; cardiac dilatation and pulmonary edema were the autopsy findings.

Four premature deaths were reported in patients with advanced tuberculosis who were on Chlorpromazine, and one report suggested a relationship to depression of the respiratory center. Four deaths were reported in patients with DT's during Chlorpromazine treatment, in which marked hypotensive or hyperthermic reactions occurred. Especially interesting were those unexplained deaths with autopsy findings similar to ours. There were at least eight instances in which pulmonary congestion or edema seemed to be the predominant finding at autopsy, but in two of these cases, the patients had been off Chlorpromazine for over five days.

The occurrence of a nocturnal seizure with asphyxia could help explain the death of Case 5, and of our lobotomized patient, especially in view of the fact that the latter had just been withdrawn from Meprobamate, which has been reported to produce barbiturate-like withdrawal symptoms (4). But this seems to be an unlikely explanation for the other three deaths, two of whom had no history of episodic loss of consciousness or of brain damage. Nor did autopsy reveal any evidence of brain damage except for the lobotomy in four of the patients. Only one of our patients, the fifth case reported above, showed evidence of having had a terminal convulsion. The cases in the literature in which strangulation was thought to be the cause of death, followed a meal, and in that respect do not resemble our cases. The gastric contents found in the trachea in one of our cases was clearly not sufficient to obstruct air passage, although a reflex spasm of the glottus could not be ruled out.

Zlotlow's four asphyxia cases all had a history of seizures or brain damage. However, two of his cases resemble ours in that they were found dead in bed, and no foreign matter was in the respiratory passage. One of his patients strangulated on food, purportedly secondary to a seizure. The neurogenic vascular disturbance proposed by Sheard could presumably lead to the vascular congestion which was such a consistent finding in each of our cases, but which by itself seems inadequate to explain death.

One can not help but be struck by the greater-than-usual instability in our five cases. Each of our patients was described as impulsively or unpredictably assaultive. Since a large majority of our total patient group would not be so described at any time in their illness, and certainly not throughout their hospital course, this fact seems worthy of some attention.

Feldman's case was a post-lobotomy patient given to aggressive and destructive behavior. The behavior of Hollister's patients was not described. Three of the four patients who died asphyxial deaths, discussed by Zlotlow, were described as "impulsively assaultive" or destructive. Sheard's patient was hallucinating and disturbed.

The obvious relationship which suggests itself is that the disturbed patients get the most tranquilizers. However, the dose of Chlorpromazine at the time of death was not particularly large in any of the patients who died. In our own hospital, it is almost impossible to find a patient who has not had a trial on a phenothiazine, and the majority of patients is now receiving them. It would probably be true, however, that the impulsively assaultive patient has tended to receive tranquilizers in greater variety, in larger doses, and over a longer period of time than other patients.

Evidence for autonomic instability or over-activity was also present in most of

our cases. Panic states accompanied by profuse perspiration, chills, flushing, blood pressure lability, and abnormal glucose tolerance curves were found upon reviewing the records. No one of these findings was present in every case, and no doubt such evidence of autonomic over-activity can be found on a careful review of the records of many patients. Nevertheless, the common behavioral features did suggest the possibility that the persistant impulsive assaultiveness or destructiveness was related to the autonomic instability, and that these patients were more vulnerable to the depressing effects of these drugs on the hypothalmus or brainstem; possibly at times of excitement, large doses are readily tolerated, but even moderate doses are too large during spontaneously occurring quiet periods.

The unpredictability of the effects of the phenothiazines on the autonomic nervous system has not been adequately explained; the most striking of these effects are the occasional sudden hypotensive reactions which sometimes occur on drug doses lower than those formerly well tolerated. Individual idiosyncrasies apparently enter into other side effects also, in the form of temperature disturbances, allergic reactions and parkinsonism, which can occur with widely different drug doses in different individuals.

SUMMARY

Five unexpected deaths occurring in patients receiving Chlorpromazine were not adequately explained by the autopsy findings of pulmonary and visceral congestion.

A thorough study of the clinical histories showed a striking similarity in the behavior of the five patients, as well as an indication of autonomic instability. The explanations offered in the literature for similar deaths were reviewed and found not entirely satisfactory to explain our cases.

It is suggested that spontaneously occurring depressions of autonomic regulation, particular during sleep, may be related to the deaths.

REFERENCES

1. Eicke, W. Contribution to Kulenkampff's and Tarnow's article: A peculiar syndrome in the oral region during the administration of Megaphen. Nervenarzt, **27:** 418–419, 1956.
2. Farber, I. J. Drug fatalities. Amer. J. Psychiat., **114:** 371–372, 1957.
3. Feldman, P. E. An unusual death associated with tranquilizer therapy. Amer. J. Psychiat., **113:** 1032–1033, 1957.
4. Friend, D. G. Meprobamate. Med. Clin. N. Amer., **42:** 1253–1268, 1958.
5. Hollister, L. E. Unexpected asphyxial death and tranquilizing drugs. Amer. J. Psychiat., **114:** 366–367, 1957.
6. Jeune, M., Carron, R. and Biancio, E. False alimentary routes and bronchial embolism in infants treated with chlorpromazine. Pédiatrie, **10:** 79–81, 1955.
7. Kline, N. S., Barsa, J. and Gosline, E. Management of the side effects of reserpine and combined reserpine-chlorpromazine prescriptions. Dis. Nerv. Syst., **11:** 352–358, 1956.
8. Kulenkampff, C. and Tarnow, G. A peculiar syndrome in the oral region during the administration of megaphen. Nervenarzt, **27:** 178–180, 1956.
9. Malitz, S., Hoch, P. H. and Lesse, S. A two-year evaluation of chlorpromazine in clinical research and practice. Amer. J. Psychiat., **113:** 540–545, 1956.
10. Moritz, A. R. and Zamchek, N. Sudden and unexpected deaths of young soldiers; diseases responsible for such deaths during World War II. Arch. Path., **42:** 459–494, 1946.
11. Renzetti, A. D. and Padget, W. R. The acute respiratory effects of chlorpromazine in man. J. Lab. Clin. Med., **50:** 400–409, 1957.
12. Roizin, L., True, C. and Knight, M. Structural effects of tranquilizers in the effect of pharmacologic agents on the nervous system. Res. Pub. Ass. Res. Nerv. Ment. Dis. **37:** 285–324, 1959.
13. Sheard, M. H. Pulmonary edema, an unusual complication associated with tranquilizer therapy. J. Nerv. Ment. Dis., **126:** 399, 1958.
14. Wardell, D. W. Untoward reactions to tranquilizing drugs. Amer. J. Psychiat., **113:** 745, 1957.
15. Zlotlow, M. and Paganni, A. E. Fatalities in patients receiving chlorpromazine and reserpine during 1956–1957 at Pilgrim State Hospital. Amer. J. Psychiat., **115:** 154–156, 1958.

BRIEF COMMUNICATION

DETERMINATION OF THE PROTEINS OF THE CEREBROSPINAL FLUID BY MEANS OF MICROELECTROPHORESIS IN AGAR GEL

H. J. VAN DER HELM, PH.D.[1]

Many investigators have carried out paper electrophoretic studies on CSF proteins (1, 2, 4). Paper electrophoresis, however, has not been generally used as a routine clinical method to determine various CSF proteins because relatively large amounts of fluid (about 10 ml) have to be concentrated (about 50 times for fluids with normal protein concentration) before the proteins on the paper supporting medium can be separated properly.

The quantity of CSF which is required for an analysis can be reduced to 2 ml, by using the microelectrophoretic technique in agar gel on microscope slides as described by Wieme (5). Moreover, the protein separations obtained with this technique give a more detailed picture. In this method a steep voltage gradient is used to complete the electrophoretic run in a short time, while petroleum ether is used as cooling liquid and to prevent water losses. The method has been applied to CSF proteins by Karcher *et al.* (3).

In our (psychiatric) hospital this form of agar electrophoresis is used as a routine method. Some of the results obtained are here reported to demonstrate the possibilities of this technique.

METHODS

Concentration of CSF: The concentration was carried out by ultrafiltration of 2 ml of fluid at 15 atm. pressure in an apparatus from the Membramfiltergesellschaft (Goettingen).

Buffer solution: 8.5 g sodium barbital and 11.5 ml N hydrochloric acid are made up to 1000 ml with distilled water (pH = 8.4, ionic strength 0.05).

Agar plates: 0.8 g of Difco Special Agar Noble is dissolved in 100 ml buffer solution. One drop of the hot agar solution is rubbed out on a clean microscope slide (26 x 76 mm). The agar is left to dry. On an horizontal surface 3 ml of the agar solution is pipetted on the slide and allowed to solidify. The plates can be stored in a refrigerator for 1–2 weeks in a box which contains wet cotton wool.

Application of the sample: A piece of rigid filter paper (5 or 10 mm) is inserted in the agar and allowed to absorb some fluid. The protein solution is introduced into the slit by means of a capillary pipette (in a 5 mm slit 5–10 µl containing 150 µg of protein). When the slit is next to dry it is covered with a drop of the agar solution, which has a temperature of about 50° C.

Estimation of the protein content of the concentrated solution: In order to obtain reproducible results with direct densitometry of the microscope slides it is necessary always to introduce the same amount of protein into the slit. The direct spectrophotometric procedure of Waddell (4) (measuring extinctions at 215 and 225 mµ) was adapted for 2 µl of the concentrated solution in 2 ml physiological salt solution.

Electrophoretic run: The slide is placed, the agar layer downward, on the agar blocks in the apparatus as described by Wieme (5) and the central tank is filled with petroleum ether. With a voltage gradient of 20 V/cm the run is completed in 20 minutes. After that, the proteins are fixed for half an hour in 5% acetic acid in 70% ethanol.

Drying: The plate is dried while covered with a sheet of filter paper. The buffer salt will also be absorbed.

Staining solution: Amidoblack 0.5 g; mercuric chloride 5 g; glacial acetic acid 5 ml; distilled water at 100 ml. Filter before use. The dried plate is then stained for 30 minutes. The stained plate is then rinsed with 5% acetic acid in distilled water, until the background is completely decolorized.

Quantitative estimation: Direct densitometry was performed with a scanner with a narrow slit. (Vitraton, Valeriusstraat 266, Amsterdam, The Netherlands).

The area under the graph was determined with a planimeter.

The results obtained with normal CSF differ slightly from those of Karcher *et al.*

[1] Provinciaal Ziekenhuis, near Santpoort, The Netherlands.

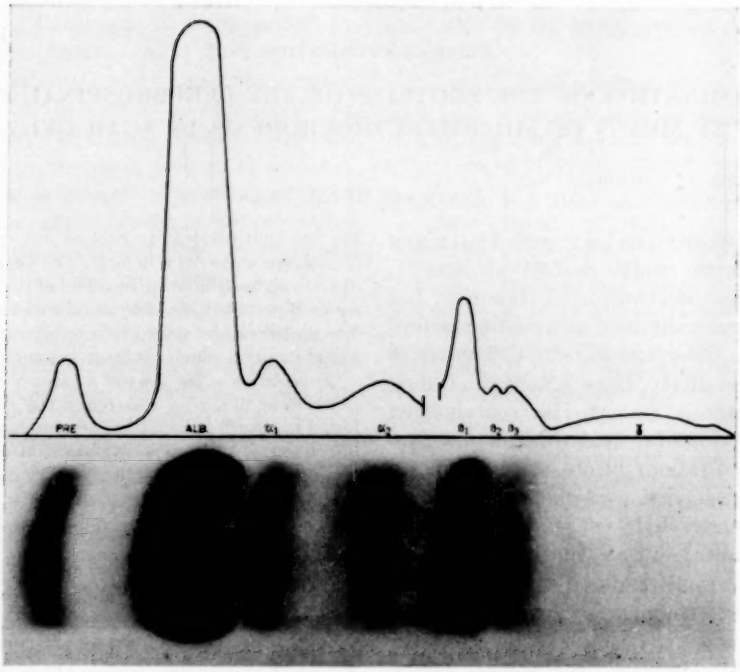

FIG. 1. Electrophoretic pattern of normal cerebrospinal fluid.

(3), probably through minor variations in the technique (slightly different pH, different concentration of agar in the gel, application of the sample not in the middle of the plate but on the side of the negative electrode). The α_1 and α_2 globulins can always be separated and the amount of α globulin ($\alpha_1 + \alpha_2$) is higher. Moreover, there are three fractions in the β region. In order to be able to name the fractions, serum proteins were subjected to electrophoresis on the same plate as CSF proteins. The electropherogram of normal CSF (obtained from patients from this hospital without evidence of neurological disease) is shown in Figure 1. The average percentages found for the protein fractions in normal CSF are given in Table 1.

TABLE 1

*Average Percentage of Proteins in Normal Cerebrospinal Fluid**

Number of Cases	Prealbumin	Albumin	Globulins					
			α_1	α_2	β_1	β_2	β_3	γ
18	5.2 (1.5)	62.0 (5.5)	7.3 (1.9)	8.8 (1.8)	3.7 (1.2)	3.7 (1.2)	2.2 (0.9)	5.8 (2.0)

* Standard deviations given in parentheses.

Far more fractions can be found in pathological CSF. Figure 2 shows the electropherogram of the CSF from a patient with the diagnosis of dementia paralytica. Three β and 5 γ fractions are easily discerned with the naked eye. The total percentage of γ globulin is 17.1 per cent. In this case all the subfractions are elevated.

Those of the electropherograms with a normal amount of total γ globulin, but where the distribution of the subfractions is abnormal, may prove to be particularly interesting.

In Figure 3 an electropherogram is shown which was made from the CSF of a patient a year after an encephalitis. In this case 30 per cent of the γ globulins are present in the last band (γ_5 in Figure 2). The total γ globulin percentage is 5 per cent.

In several cases a fraction was found be-

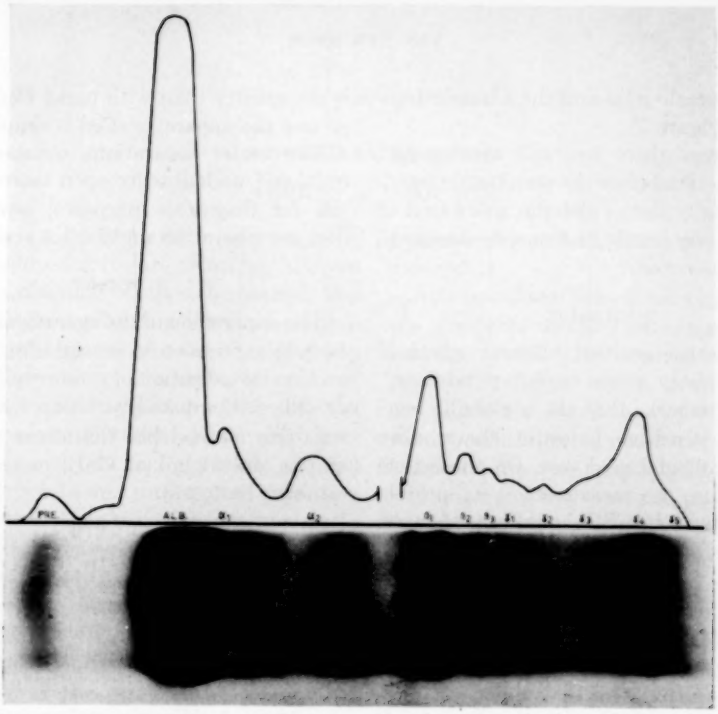

FIG. 2. Electrophoretic pattern of the cerebrospinal fluid of a patient with dementia paralytica.

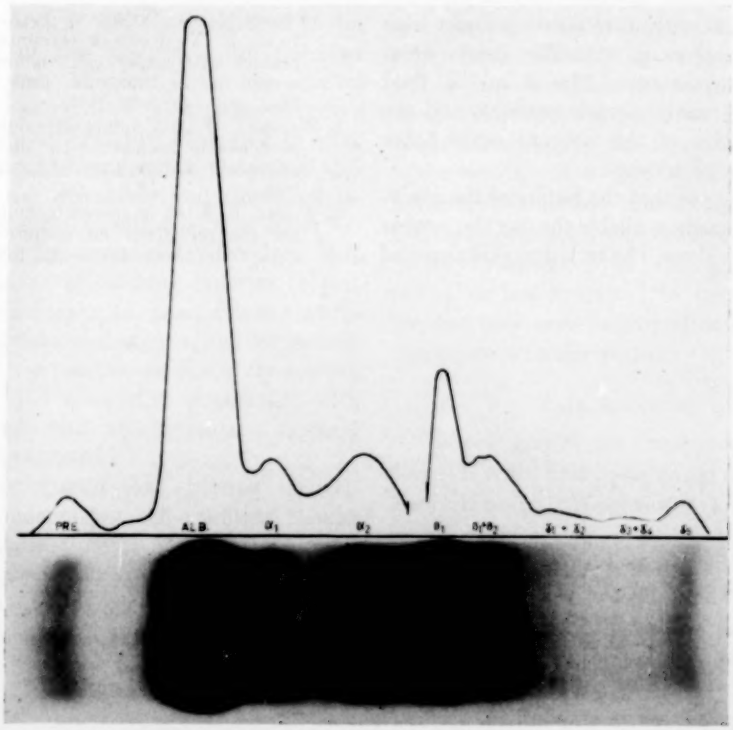

FIG. 3. Electrophoretic pattern of cerebrospinal fluid with a normal percentage of γ globulin where the distribution of the subfractions is abnormal.

tween the prealbumin and the albumin fraction (*e.g.*, Figure 2).

In one case there was still another fast moving fraction before the prealbumin band.

Occasionally the α_2 globulin was found to consist of two bands and once a double α_1 fraction was noted.

DISCUSSION

In his article entitled "Recent advances in the chemistry of the cerebrospinal fluid," Green (2) remarks that the γ globulin level is a more sensitive index of abnormality than the colloidal gold test. On theoretical grounds, too, the measurement of protein constituents of the CSF should be preferable.

The fact, however, that electrophoretic separations of the CSF proteins require the concentration of large amounts of fluid, and that the concentration methods are time-consuming and introduce potential sources of error, is the basis for the opinion of Green, that paper electrophoresis is not suitable for routine analyses.

The technique described in this paper, in combination with ultrafiltration under high pressure, suffers in a smaller degree from these disadvantages. The 2 ml of fluid needed is nearly always available and the concentration of this amount never takes more than 90 minutes.

It is possible that the results of the analysis can be made available the day the lumbar puncture is done. The technical skill required is not greater than with paper electrophoresis and the apparatus used is simple.

The better separations obtained, moreover, will undoubtedly open more possibilities for diagnostic purposes, especially in diseases where the γ globulins are involved.

SUMMARY

The application of the agar electrophoretic technique on microscope slides of Wieme to routine investigation of cerebrospinal fluid is described. Compared with paper electrophoresis this method has the advantage of requiring only 2 ml of CSF; more fractions can also be found.

REFERENCES

1. Booy, J. In Antweiler, H. J. *Die Quantitative Elektrophorese In Der Medizin*, pp. 164–192. Springer, Berlin, 1957.
2. Green, J. B. Recent advances in the chemistry of the cerebrospinal fluid. A. M. A. Arch. Neurol. Psychiat., **80:** 359–374, 1958.
3. Karcher, D., van Sande, M. and Lowenthal, A. Microelectrophoresis in agar gel of proteins of the cerebrospinal fluid and central nervous system. J. Neurochem., **4:** 135–141, 1959.
4. Lemmen, L. L., Newman, N. A. and De-Jong, R. N. Study of cerebrospinal fluid protein with paper electrophoresis. I. A review of the literature. Univ. Michigan Med. Bull., **23:** 3–32, 1957.
5. Waddell, W. J. A simple ultraviolet spectrophotometric method for the determination of protein. J. Lab. Clin. Med., **48:** 311–315, 1956.
6. Wieme, R. J. An improved technique of agar gel electrophoresis on microscope slides. Clin. Chim. Acta, **4:** 317–322, 1959.

BRIEF COMMUNICATION

ANOREXIA NERVOSA

LAURENCE LOEB, M.D.[1]

Although cases of anorexia nervosa in its fully developed form are relatively uncommon, the disorder of appetite bearing this name has been receiving increasing attention in the literature of both internal medicine and psychiatry. In spite of excellent clinical descriptions of the syndrome and many theoretical studies of the dynamics felt to be important in individuals afflicted with this condition, controversy regarding the existence of anorexia nervosa as a single disease entity remains.

The historical material related to the recognition of this condition, dating from Gull's writings in the late nineteenth century, is sufficiently known. Gull's clinical description of the condition is classic, and little has been added since his original writing. The criteria for the recognition of anorexia nervosa have largely been derived from this description, and those adhered to for purposes of this discussion are those of Deutsch and Murphy (4). "The clinical picture is marked by (a) a progressive loss of appetite and reaction of disgust to food, (b) constipation and minor abdominal discomfort, (c) irritability and emotional lability, exhaustion and weakness often accompanied by a complete denial of that state, and an astonishing capacity to perform routine tasks, (d) amenorrhea, emaciation, hirsutism, and anemia, and (e) secondary psychic repercussions due to the implied meaning and associative connection with eating and with the secondary physical changes mentioned."

It is recognized that, barring the criterion of amenorrhea, the condition, though infrequent, may occur in men. For a thorough review of the condition, the excellent papers of Nemiah (8, 9) are strongly recommended.

Attempts have been made to suggest that the symptom-complex of anorexia nervosa is characteristic of one or another established psychiatric disease entity. Bruch (1, 2) suggests that the condition represents a true misrepresentation of reality, that delusion-formation must be considered to exist. Wall (10) originally felt that such problems eventually fell into the purview of the simple schizophrenias, but later (11) recognized that the syndrome could be a manifestation of other diagnostic groupings. It is, perhaps, significant that most of the literature pertaining to this condition relates to that which appears in adolescence and the next period of life, young adulthood.

Three cases, believed to represent true, fully developed cases of anorexia nervosa are here reported, in females, ages twelve, thirty-two, and fifty-two respectively. It will be suggested that the condition known as anorexia nervosa does not represent a single disease entity, but is, rather, a symptom-complex, often presenting in diverse forms of psychiatric illness: further, that this symptom-complex, though most frequently manifested in the peri-pubertal period, is not restricted to that phase of life, but may exist as part of definitive disease pictures at any period.

CASE REPORTS

The youngest of the three cases here reported is a girl first hospitalized at the New York Hospital, Westchester Division, at twelve years of age. The patient had been overweight nearly all of her life. She had been teased on this account, and began dieting in the spring of the year of her hospital admission. During the ten days prior to ad-

[1] New York Hospital, Westchester Division. Present address: 50 Popham Road, Scarsdale, New York.

mission, she had eaten no solid food, subsisting entirely on low calorie soft drinks.

An appreciation of the background of the patient aids in an understanding of what food may have meant to her on one level. Her maternal grandparents, with whom she lived, were of a culture that placed great emphasis on eating, and on eating well. With the (then) exception of the patient, the entire family was obese. Her mother had an unusually long medical history, including duodenal ulcer, with hemorrhage, and hypertension. After the premature birth of the patient, her mother required hospitalization for several months for acute rheumatic carditis. At this point, the husband, a self-styled service malingerer, according to history, deserted his wife. This step resulted in separation and eventual divorce. When the mother remarried a man from a lower social stratum, the grandparents legally adopted the patient.

The patient was born in a suburb of New York City, weighing under five pounds. As an infant, feeding was difficult: the patient had at least one episode of cyanosis during bottle feeding. Weaning is said to have been uneventful at a year and a half. The patient exhibited neurotic traits through childhood; thumb-sucking, enuresis, and unwillingness to sleep alone persisted through latency. The last-named problem was dealt with by permitting her to sleep with her grandfather. During her ninth year, her grandfather was operated on for bladder tumor. At this time, the patient made, and kept, a "vow to God" not to eat cake, candy or ice cream for a year. At ten she became preoccupied with death. At eleven she became afraid of spiders and the family dog, and began a compulsive scrubbing of her genitals while showering, which would continue for hours at a time. Some months before admission, she was rather cruelly taunted and called fat by a cousin. She began a rigid diet, became constipated, and spent an inordinate amount of time in the shower and at the toilet. She adhered to her self-imposed diet, walked and rode her bicycle for hours, lost over forty pounds in three months, had no solid food for the ten days prior to admission, and finally fainted while in the shower.

In psychotherapy, she initially described her compulsions as a "magic way to remain different from other people." Fantasy life largely revolved around sexuality, urination, and masturbation, the patient equating masturbation with guilt and dirtiness—masturbation causing a cancer—cancer representing a growth that kills—and a growth as a pregnancy, saying, "people who are thin can't have babies" and "I lost weight because my stomach looked so big, it looked like I was pregnant."

The patient's sexual fantasies began at the age of six, according to her account, after observing the urination of a young male cousin. Urination became linked with the sexual function in her mental life, and the fantasy of the sexual act consisting of mutual urination began. When she was nine and sharing her grandfather's bed, she was enuretic. When her grandfather developed bladder malignancy, it is highly probable that she felt this was related to her sexual fantasies. It was at this time that her renunciation of food began. She did relatively well after this until the beginning of puberty, when forthcoming sexuality brought to her, in full force, all of the implications of impending danger. Her grandfather's severe illness, his operation, and the concepts of menstruation and childbirth recalled for her the difficult circumstances of her own birth and the illness and hospitalization of her mother at that time, all of which had been described to her often and dramatically. Adulthood became an extraordinarily frightening thing. The wish not to grow, and to renounce adulthood with all of its implications, was acted out in this "magic way to remain different from other people."

This patient represents what is generally considered as the "typical" anorexia patient. Her family history is significant, particularly with regard to the difficulties posed for her

in terms of identifying with her mother. Historical features include premature birth, early feeding difficulty, neurotic traits throughout childhood, compulsivity appearing before puberty, and obesity prior to loss of control of dieting. All organic studies were found to be within normal limits, including skull X-rays, electroencephalogram, and laboratory studies. Mental status and psychological testing failed to reveal the presence of a psychotic process, and at diagnostic staff conference it was felt that the patient could best be seen as having a mixed psychoneurosis, manifested for the most part by compulsive and obsessive features, but including hypochondriacal and phobic features as well.

The second patient was thirty-two at the time of her admission to the New York Hospital, Westchester Division, following a suicide attempt during the course of outpatient psychotherapy.

This patient was born in Western Europe to a family to whom intellectual attainment was of considerable importance. Her father appears to have been a gentle, sweet, and rather passive man, well-educated but rather ineffectual in his relationships within and without his family. Her mother, in contrast, was said to have been a masculine, aggressive woman, a militant feminist, coldly intellectual, raising her two daughters as if they were boys. The patient found it difficult to get at all close to her mother, and early turned for affection to her grandmother and a series of governesses. Early food and bowel training was severe, methodical, and almost punitive in its nearly militaristic aspects. At age five, the patient developed a private language. She applied herself to her studies, virtually removing herself with outside social contact, apparently to satisfy what she conceived of as her mother's wishes. From adolescence through college she had periods of obesity alternating with marked weight loss from rigorous dieting, "secret and guilty eating," amenorrhea and severe bowel problems. Her characteristic defenses against instinctual impulses were those of compulsivity and marked intellectualization. She did not recognize the need for psychiatric assistance until her third decade, when, in the setting of her first heterosexual relationship, feelings of panic led her to seek help. In therapy, as she began to be aware of her enormous dependency needs, she impulsively attempted suicide. This eventuated in hospitalization in a quite disorganized state.

The patient spoke often of her inability to conceptualize an adult female role, seeing her pursuit of a doctoral degree in terms of competition with her sister and mother. One of several dreams reported suggested fantasies of oral impregnation and anal birth: she had eaten some chocolate, to find that her feces were cocoons which became metamorphosed into beautiful butterflies.

Projective tests supported the diagnosis of a catatonic type of schizophrenic reaction, which diagnosis was subsequently confirmed at staff conference. During the patient's hospital course and convalescence, food and weight concerns, with constipation, were prominent, though she never progressed to emaciation, her weight remaining relatively stable.

The oldest of this group of three patients was a housewife admitted to the New York Hospital, Westchester Division at age fifty-two following depression and suicidal preoccupation. Her family history was an unusually tortuous one, as her true father deserted his wife during her pregnancy with the patient. The child was turned over to the mother's sister, and her true mother remained in the household with sister, her husband and patient. The true mother was treated as a servant. The aunt, whom the patient believed to have been her mother was described as having been overbearing, possessing a nasty tongue, lacking in tact and diplomacy, but with a genius for cooking and baking. Of the patient's early life, a cousin wrote that she "always had two mothers hovering over her—both feeding—

one forcing—the other pleading for her to eat." The aunt was extremely punitive to both patient and her mother, as was the uncle. The patient was understandably upset, when, at age twelve, she inadvertently discovered the identity of her true mother, a woman who her aunt would not respect, nor permit the girl to respect. Shortly thereafter, the patient became anorexic. This continued through adolescence, with periods of amenorrhea, but without emaciation. At the time of her engagement, the problem was worsened, but she was able to maintain a reasonable nutritional state until her marriage. At this time, she decompensated, losing a great deal of weight, but again recovered without help. At age forty, she entered psychotherapy because her eating difficulties were again getting out of control. Two years of analytic therapy resulted in marked improvement, and the patient did well until her fifty-second year. At this time, a diagnosis of mild diabetes mellitus was made. She became increasingly concerned about the effects this might have upon her food intake, felt that she was aging rapidly, began to read obituary notices, developed an agitated depression, and threatened suicide. Hospitalization was arranged. Fantasies of homosexuality were prominent in addition to her food and bowel concerns, and masturbatory fantasies revolving about a masculine role in homosexual relations were described. It is interesting to note that this patient, in spite of her manifold sexual difficulties, bore children.

The psychiatric diagnosis was that of involutional reaction, melancholia. The patient responded well to electroshock therapy followed by treatment with the phenothiazines accompanying psychotherapy.

COMMENT

Psychiatric thinking about anorexia nervosa, at this time, is suggestive of that concerning the groups of schizophrenias at the time of Kraepelin's nomenclature formation, in that the pubertal and "praecox" aspects have been emphasized to the neglect of the realization that these conditions could appear at later periods of life.[2]

The manifold dynamics regarding anorexia nervosa have been thoroughly and well discussed by many writers. Deutsch and Murphy (4) point out that it is as if ". . . open conflict between . . . mother and daughter, with feelings on the daughter's part that genital sexuality . . . is inimical to the welfare of the mother" seems important in the psychogenesis of this state. This statement is reminiscent of the description of symbiotic child psychosis, in which it is felt that the child somehow sees its existence as being necessary for the integrity of the maternal ego (7). Cobb (3) sees the combination of a somehow inadequate endocrine system, fear of womanhood, and bad relations with the parents as causative in its production. Fantasies of oral impregnation are emphasized by some (6), where others (10) see anorexia nervosa as remarkable in the absence of such fantasies.

In all formulations regarding the psychogenesis of anorexia nervosa, one central concept seems to be constant. The patient cannot tolerate the threatening idea of growth. It is, perhaps, useful to conceive of this "Peter Pan" syndrome as the acting-out of the wish not to grow, to remain always the favored dependent child, unthreatened by the demands of sexuality, of adulthood with its attendant responsibilities. Growth, however, does not cease with genital maturation, but is implied in any transitional life period.

The three cases here described are believed to fulfill the usual criteria for the diagnosis of anorexia nervosa. It is noteworthy that each patient here discussed, because of early problems relative to her mother, or mother-substitute, may have had enormous difficulty in adequate identification with a healthy adult female. Each case presented additional symptomatology for which support of other psychiatric diag-

[2] I am indebted to Dr. Curtis T. Prout for this observation.

noses could be found. Each is manifested at a different period of life. It is suggested that the condition known as anorexia nervosa is not an isolated disease entity, but is rather a symptom-complex, which may present at any phase of life in which growth, whether physical or emotional, is required. It is further suggested that this condition is not one with a progressive downhill course with ultimate fatal consequence, but one which, although often initially presenting in adolescence, may persist in sub-clinical forms with recrudescence in periods of life requiring growth, in which decompensation may occur.

REFERENCES

1. Bruch, H. *The Importance of Overweight*, p. 312. Norton, New York, 1957.
2. Bruch, H. Psychopathology of hunger and appetite. In *Changing Concepts of Psychoanalytic Medicine*, Rado, S. and Daniels, G. E., eds, pp. 180–191. Grune & Stratton, New York, 1956.
3. Cobb, S. *Emotions and Clinical Medicine*, pp. 140–182. Norton, New York, 1950.
4. Deutsch, F. and Murphy, W. F. *The Clinical Interview*, Vol. 1, pp. 468–519 International Universities Pr., New York, 1955.
5. Fenichel, O. *Collected Papers*, Vol. 2, pp. 288–295. Norton, New York, 1954.
6. Freud, A. Adolescence. Psychoanal. Sudy Child, **13:** 268, 1958.
7. Mahler, M. S. On child psychosis and schizophrenia: Autistic and symbiotic infantile psychoses. Psychoanal. Study Child, **7:** 286–305, 1952.
8. Nemiah, J. C. Anorexia nervosa: A clinical psychiatric study. Medicine, **29:** 255–268, 1950.
9. Nemiah, J. C. Anorexia nervosa: Fact and theory. Amer. J. Dig. Dis., **3:** 249–274, 1958.
10. Wall, J. H. Anorexia nervosa. Bull. N. Y. Acad. Med., **32:** 116–126, 1956.
11. Wall, J. H. Diagnosis, treatment, and results in anorexia nervosa. Amer. J. Psychiat., **115:** 997–1001, 1959.

OPLER, MARVIN K., ED., *Culture and Mental Health*. The Macmillan Company, New York, 1959. xxi + 533 pp. $8.75

This volume is the first collection of studies dealing with the cross-cultural aspects of mental health and mental illness. As such, it is a milestone in the literature and is a most welcome addition to the growing body of data in this area. The background of Dr. Opler, which includes studies in both psychiatry and cultural anthropology, eminently qualified him for the job of editor for this very heterogeneous and intriguing group of articles.

The volume consists of 23 articles (16 of these published for the first time) authored by individuals in the professions of medicine and the social sciences. Organizationally, the material is divided into an introduction on "The Cultural Backgrounds of Mental Health," and is followed by sections pertaining to the American Indian, and peoples of the South Pacific, Asia, and Africa. The final set of articles deal with aspects of personality and mental health of a few minority groups in the United States.

Although the focus of the entire volume is "social psychiatry," a balance is maintained between research dealing with specific mental disease problems in non-Western cultures, and both theoretical and empirical studies in culture and personality relationships. Quite in keeping with the flux and heterogeneity in this field of endeavor, the studies reported in this volume utilize a wide range of research methods. The contribution by Melvin Spiro, on "Cultural Heritage, Personal Tensions, and Mental Illness in a South Sea Culture" demonstrates an attempt to relate cultural and psychological dynamics by an intuitive clinical approach based mainly on psychoanalytical theory. In contrast to this, there is the article by H. B. M. Murphy, which is a carefully documented statistical study of mental disorder in Singapore. In the best tradition of epidemiological research, this author teases out the mental health implications of such cultural factors as type of family relationships, the social role of the aged in the particular society, and child-rearing practices.

In the opinion of this reviewer, among the most stimulating studies in this collection are those contributed by Marvin Opler and A. Irving Hallowell. Opler, basing his thinking on previous studies of Italian and Irish family structure and relationships, derives a series of hypotheses concerning certain behavioral symptoms, *e.g.*, violent acting-out and homosexuality, of schizophrenics in these two ethnic groups. Using a sample of mentally ill Irish and Italian patients, he explores the hypotheses and demonstrates some intimate relationships between socio-cultural variables and mental disorder. Hallowell's article is a theoretical discussion based on material that he gathered while living with the Ojibwa Indians of Canada. He shows not only how different cultures engender specific types of psychic stress and strain in the individual, but also how the culture provides mechanisms for the resolution of such tensions. Unlike many such discussions, Hallowell's remarks are suggestive for an understanding of social mechanisms resulting in mental health, as well as mental disorder. He also demonstrates the fact that the evaluation of behavior, as well or as ill, must be made with knowledge of the cultural context in which the behavior occurs. By implication, Hallowell's work indicates the difficulty of trying to establish universal, *i.e.*, culture free, definitions of mental disorder at this stage of the development of the field.

Aside from the quality, the methods, and the findings of the various articles, what can we say about the overall character and contribution of the volume? What does it offer aside from the sum of the values of

the individual articles? Opler says in his introduction that "these are intended to be pioneering studies in world mental health, each of which establishes important findings within a more total pattern of basic questions concerning mental health. It is easy to miss these fundamental challenges and to call this, instead, a round the world survey of mental health, which it most certainly is not." Unfortunately, this reviewer feels that the editor has not fulfilled his task of facilitating the accomplishment of his stated purpose. Opler does not attempt to tease out the "pattern of basic questions" that he refers to. There is no effort to point to some of the directions that research has taken in this field of endeavor, or which paths need further exploration. The editor has not provided some needed transitions between these rich and very diverse articles. Organizationally, the book remains a "hodge-podge," in spite of the high quality of individual articles.

Seymour Parker

RITHOLZ, SOPHIE. *Children's Behavior*. Bookman Associates-Twayne Publishers, New York, 1959. 239 pp. $5.00

It is puzzling to read a book copyrighted in 1959 which reports on a research study conducted in 1944–45. Why the author took so long to publish her results is not clear. In fact, what purpose was served by writing this book is also something of a mystery.

The book is a report of a follow-up experiment originally done by E. K. Wickman and published by Wickman in 1928. Wickman's book, *Children's Behavior and Teacher's Attitudes*, published by the Commonwealth Fund, reports on the differences between the attitudes of teachers and workers in child guidance clinics towards specified behaviors of children. Those readers of JNMD who would like to know about this research and current follow-up should read *Psychology of Adjustment* by Shoben and Shaffer (1957 revision), or see the article by E. C. Hunter in the January, 1957, issue of Mental Hygiene magazine. This reviewer cannot recommend Ritholz's report because it is over-detailed in its discussion of unimportant statistical data, it seems padded to book length and it is clearly out of date. There is a charm and sprightliness about Miss Ritholz's style when she makes non-statistical conclusions but this alone cannot justify this book. It is of no value to those interested in children's behavior, and its belated treatment of the subject matter is of no help to those interested in questionnaire studies of children's behavior.

Sol Charen

BULLARD, DEXTER M., ED. *Psychoanalysis and Psychotherapy: Selected Papers of Frieda Fromm-Reichmann*. University of Chicago Press, 1959. xiv + 350 pp. $7.50

Frieda Fromm-Reichmann was outstanding on the contemporary scene as a psychoanalyst in the humanitarian tradition; her concern with the totality of man's existence, coupled with an exceptional sensitivity to the most delicate nuances of human behavior, allowed her to transcend the narrow confines of any particular school of thought and to become the "good therapist" in every sense of the word. Yet, she did not succumb to the temptations of cultism, and her writings to the end of her life reveal an acute critical mind and a persisting concern with the theoretical understanding of her psychotherapeutic experiences. These are the qualities that make Fromm-Reichmann's papers classics in the field of psychotherapy, and that evoke this reviewer's gratitude for the opportunity to have the best of them collected into one volume.

While her insights and clinical descriptions are applicable to work with a variety of patients, Fromm-Reichmann was, of course, best known for her psychotherapeutic work with psychotics. Some of the flavor of her work is caught in Edith Weigert's foreword to this volume. Weigert writes, "It seems to me that Frieda Fromm-Reich-

mann's success was based not only on her knowledge and experience, but also on the exceptional character qualities which she brought to her challenging experiments. Frieda was courageous . . . she was all there with the patient . . . brushing aside the barriers of conventionality. She remained fully open . . . to what lies beyond transference and counter-transference in the realistic interpersonal relation between doctor and patient. . . ."

In these terms Fromm-Reichmann's work reflects the thought and feeling of one of the significant psychiatric personalities of our time; it also contributes to the understanding of one of the controversial issues in present day psychoanalysis and psychotherapy. That is, the question of the therapist as a real person, with an impact upon his patient and a contribution to the therapeutic situation which cannot be understood solely in transference terms. It required courage to acknowledge that psychotherapists can hide behind an insistence on the patient's sole responsibility for what transpires in therapy. Surely, the model of a helper who denies his own essential humanity cannot be useful for the anxious patient. But it also required intelligence and integrity to build upon, rather than to categorically deny the theoretical framework of therapy which is based mainly on Freud's fundamental contributions.

Eugene B. Brody

HOCH, PAUL H. AND ZUBIN, JOSEPH, EDS. *Problems of Addiction and Habituation.* Grune and Stratton, New York and London, 1958. xii + 250 pp. $6.50

Addiction to drugs of one kind or another is a major public health problem which may be expected to increase in magnitude and complexity in the future. Addiction is frequently called a disease—the implication being that particular types of addicts are in some respects a homogeneous population of individuals with a single and unique defect. There is no unanimity of opinion as to what the basic defect is; protagonists of different schools favor defects in personality, biochemical constitution, socio-economic forces or the nature of the drug and the individual's particular experience with it. These etiological biases give rise to protagonists of regimens for managing or treating the addict, such as prophylactic measures which aim at preventing the maturing individual from encountering adverse and anti-social situations; educational measures which aim at giving individuals a more mature view of the world and themselves; legal controls which aim at preventing individuals from having access to drugs and providing custodial care for recalcitrant abusers of drugs.

Problems of Habituation and Addiction is a collection of papers presented at the Proceedings of the American Psychopathological Association to permit, in the words of the editors, "the representatives of the different approaches to meet face-to-face, so that some of the issues could be clarified by personal interchange." In publishing only the papers that were presented and the comments of the invited discussants, who by and large concerned themselves with technical points, the reader is deprived of the benefits of the interchange and any resulting clarification. Three papers deal specifically with various aspects of the treatment of alcoholics and narcotic addicts: treatment of symptoms in alcoholics, psychotherapy during management of acute withdrawal from narcotics and group therapy in the treatment of chronic alcoholism. An experimentally oriented student of the addiction problem will find these papers disappointing for one of several reasons, which include failure to clearly define experimental procedures and end points and failure to present data other than anecdotal accounts of the efficacy of these therapeutic procedures. These failures are in part due to the illicit, antisocial and chronic nature of the addiction process which makes difficult the acquiring of valid, reliable data. In view of

the history of the treatment of the opiate abstinence syndrome, workers in this field should be especially cognizant of the futility of proposing therapeutic measures without testing or being able to test their efficacy. Pros and cons of whether drug addiction should be the responsibility of law enforcement agencies or treated as a sickness by physicians are presented by W. L. Spears and K. M. Bowman. On the fringe of the habituation problems are papers that deal with the pharmacology of caffeine and the etiology of pica, which is presented as a type of addiction (habituation). The greatest number of papers in this volume deal with the etiology of drug addiction. Rasor has reviewed not only theories but pertinent data on the personality structure of addicts. Several papers dwell at length on the nature of the addict's self-image and how this self-image is altered by drugs. The evidence advanced in these papers supporting the contention that addicts comprise a population that hold themselves in low esteem and that narcotics produce an elevation of the self-image is by and large based on clinical impressions. While the clinical descriptions of personality defects observed in addicts as well as discussions of psychodynamic forces that may contribute to the addiction process make interesting reading, these articles lose much of their import because no effort is made to integrate the clinical observations with the excellent recapitulations of Liddell and Masserman on experimental neuroses. Many of these papers add support to the frequently advanced formulation that the addict commonly has neurotic personality defects and uses drugs to allay his anxieties; neurotic signs can be produced experimentally in animals and addicting drugs (morphine, alcohol and barbiturates) will diminish the sign of the experimentally produced neurosis. It is not unreasonable to assume that a neurotic personality is the fundamental defect of the addict, and, admitting this assumption, the following questions demand an answer: 1) Can neurosis be prevented by assuring an environment free of major recurring traumatic influences, 2) can the neurotic personality be reformed by education and counselling, and 3) can the neurotic's symptomatology be relieved by innocuous drugs or are drugs that provide relief to the neurotic inherently addicting? Specialists in addiction will find in this volume many things with which to disagree. The fact that it is a collection of papers precludes a systematic presentation of the various facets of drug abuse which will limit its appeal to the non-specialist. These criticisms would apply in some degree to any volumes on drug addiction and habituation. At the present time no concise or definitive answer can be given to the many problems concerning drug abuse and drug abusers.

W. R. Martin

DUNHAM, H. WARREN. *Sociological Theory and Mental Disorder*. Wayne State University Press, Detroit, 1959. xi + 298 pp. $5.50

This book consists of a collection of papers that, in the author's words, "represent restricted efforts to make a contribution to three central problems in this field: 1) Does the incidence of mental disorder and its various types show any significant variation by social class, ecological space or time periods in a given society? 2) Can any relationship be established between the type of premorbid personality structure and the kind of mental disturbance or mental symptoms that a person develops? 3) Is the cultural organization of society primarily selective or causative with respect to the differential incidence or mental disorder within a given human society or between different human societies?" (pp. 1–2).

Dunham has done pioneering work in the first area—his study of the distribution of the functional psychoses in the social areas of Chicago is well known, as is the more extended work that he and Faris published later. His original 1936 paper is in-

cluded in this book, along with a previously unpublished epidemiological study of mental disease in the United States, and some general papers on the ecological and epidemiological approaches to mental illness.

His work in the second and third areas is likely to be less well-known to psychiatrists. It is manifested in an attempt to characterize the personal pre-psychotic traits of the "catatonic schizophrene" and the "paranoid-schizophrene" and indicate how these traits conditioned their social relations before breakdown, an examination of the relationship between schizophrenia and conviction for criminal behavior, and examinations of the relation between both war and old age and mental disorder.

Is the book worth reading? It depends. Dunham has done some interesting work, and portions of this book represent it. For this it is well worth reading, even by those who are not particularly familiar with the work of sociologists in the area of mental illness.

But its title implies that the book involves something more—a kind of overall assessment of the way sociology can contribute to knowledge about mental illness. And indeed, at least six of the fifteen chapters represent attempts at such assessment. Unfortunately, while those essays are competent and have good bibliographies, they are too personal to serve either a general purpose or even Dunham's purpose of presenting his own views. The reader is not made sufficiently aware of the framework of argument and data to be able to tell very much about Dunham's own position, let alone that of others and of sociologists in general. Sometimes discussion is in insufficient detail to allow the reader even to understand what the arguments are all about. This is particularly the case for views that differ from those of the author—the mention of Clausen and Kohn's critical examination of the ecological approach to mental illness, for example, is so brief as to be useless, leaving the reader both uninformed of the issues and of the exact location of Dunham's own position. Nor is the reader given much of an idea of other important work in the field—surely, to take one prominent example, the recent Yale studies deserve somewhat more discussion than the mention that they were "designed to tighten up the earlier study by R. E. L. Faris and myself, particularly from the standpoints of case definition and case coverage." Copious footnote citation without discussion does not do much more than inform the reader of the existence of a study.

In sum, this book can be recommended as a valuable collection of one sociologist's papers on various aspects of mental illness, but not as a useful introduction and assessment of what sociologists are doing and thinking about in the field.

Eliot Freidson

WRIGHT, BEATRICE A. *Physical Disability: A Psychological Approach.* Harper and Brothers, New York, 1960. xx + 408 pp. $6.00

In the foreword to this book, Roger G. Barker, Professor of Psychology, University of Kansas, and long-time co-worker and co-author with Dr. Wright comments, "Variations in physical size, beauty and normality, for example, are widely presumed by businessmen, artists, and athletes, by politicians, suitors and doctors to be important causal variables within the total context of factors which determine behavior and personality."

No one can dispute Dr. Barker or the fact that the somatopsychological relationship—by whatever term one may use—has long intrigued psychologists.

Dr. Beatrice A. Wright is one of those psychologists who has long been intrigued by "those variations in physique that affect the psychological situation of a person by influencing the effectiveness of his body as a tool for action or by serving as a stimulus to himself and others."

She has co-authored a number of books with Dr. Barker, including the classic *Ad-*

justment of Physical Handicap and Illness: A Survey of the Social Psychology of Physique and Disability, of which H. R. Glonick was also co-author and which was published in 1953 by the Social Science Research Council. She has worked with Tamara Dembo on a number of studies in somatopsychology and in 1959 received an award from the National Council on Psychological Aspects of Disability, a division of the American Psychiatric Association.

The reader, therefore, can assume when he picks up this volume that Dr. Wright is an authority on the subject and knows of what she speaks. The book to a large degree bears out that assumption.

After deftly "Circumscribing the Problem," as she titles the first chapter, Dr. Wright runs the full gamut of psychological theories of behavior, such as inferior status position, salutary status position, frustration and uncertainty, value changes in acceptance of disability, development of self-concept, and self-concept and perception of interpersonal relations. Each of these chapters is then sub-divided. For example, under "Salutary Status Position" are such subdivisions as coping vs. succumbing, expectation discrepancy, suffering and understanding, outstanding success, and dilemma of contradiction in status.

In each of these behavioral classifications, she defines the classification and then quotes liberally from other works of examples of such behavior among the physically handicapped. Most of the quotations are from autobiographies which are well-known among rehabilitation workers. The quotations are well chosen and Dr. Wright succeeds very well in achieving her objective.

When, in the latter part of the book, Dr. Wright attempts the same technique in using excerpts from case histories and other works to illustrate the therapeutic approach to resolving some of these psychological problems she has analyzed so clearly in the earlier sections, the results are not well-achieved. The fault lies probably not so much in the author's experience, skill and editorial competence as in the difficulty of the task. The problems themselves make psychological diagnosis extremely complex, but to attempt to describe the therapeutic methodology indicated in but a few pages is well-nigh impossible. The use of short quotations to illustrate how the indicated therapeutic methodology achieved results tends to give an impression of over-simplification.

This criticism should not be construed to imply that *Physical Disability: A Psychological Approach* is not an important contribution. It is a book of real significance to all psychologists, psychiatrists, social workers and counselors concerned with physical disability. In reading it, one easily visualizes how it will be used effectively with students.

That Dr. Wright is a highly skilled, experienced and conscientious worker is evident in this volume. She has made a rich contribution by attempting to bridge the gap between the psychological theroreticians and the practical clinicians. In the section of the book dealing with diagnosis and evaluation, she has succeeded quite well. The results in the section dealing with therapeutic methodology are not quite so successful.

Howard A. Rusk

WILMER, HARRY A. *Social Psychiatry in Action*. Charles C Thomas, Springfield, Ill., 1958. xxiii + 373 pp. $8.75

At the beginning of *Social Psychiatry in Action* Dr. Wilmer makes it clear that his study has not produced any new theoretical concepts but is only a report of some operational aspects of a therapeutic community. The report is a good one and attests to the value of diligent observation in studies of group interaction. However, because this book covers a wide range of behavioral phenomena of both patients and therapists, a number of very interesting facets were only cursorily explored and poorly developed. An example is the important issue of role identity in a military therapeutic community. Dr. Wilmer states, "in the Oakland

therapeutic community I found that my identification with the Navy in a role clearly defined by military custom—by authority, not only as a doctor, but as an officer—gave force to my expectation that others would remain in their roles, however sick they were; that this was their task. They were required by these roles to respect the corpsmen and the nurses and to behave in the full knowledge that they were within the Navy culture. Thus the Navy culture itself was utilized to strengthen the structure of the unit. Occasions were provided for discussing the difficulties the men had in fulfilling their roles and for investigating how far their own inner difficulties gave rise to difficulties in these roles." Thus, as a positive feature, in the Oakland therapeutic community both patients and caretaking personnel shared a *similar identity via* membership in a common military culture with its own specific set of protocols and behavioral expectations. However, as a negative feature, therapy in a military setting was complicated by the physician's dual role as officer and therapist. It might be postulated that the ambivalent expectancy of the patient for caretaking and discipline from the officer-doctor would result in a poor therapeutic alliance. These negative and positive factors apply equally to the military nurse-patient relationship and probably most important to the attendant (corpsman)-patient relationship. It has been pointed out by many investigators working in large and overcrowded mental hospitals that the relationship between ward personnel and patients is frequently a crucial variable affecting the patient's progress and recovery. There have been those, including Dr. Wilmer, who have attributed much of the success of the ataractic drugs to their effects in making ward personnel feel more secure and comfortable and thus improving personnel-patient relationships. The Navy psychiatric ward corpsman, who is so closely identified with the patients as to age, cultural milieu and environmental kinship, has an enormous impact upon the patients' care and progress. There are many anecdotal reports in Dr. Wilmer's text suggestive of this, and it would have been most interesting to see this particular area further developed.

Among the merits of *Social Psychiatry in Action* is that it presents a detailed description of one type of contemporary military psychiatric practice. Military neuropsychiatry during World War II had a great effect upon stimulating research in the behavioral sciences. Dr. Wilmer's book indicates that military psychiatry continues to offer excellent hypothesis-seeking opportunities, especially in the area of group processes.

Jack H. Mendelson

PEATMAN, JOHN G. and HARTLEY, EUGENE L., EDS. *Festschrift for Gardner Murphy.* Harper & Brothers, New York, 1960. vii + 411 pp. $6.00

To many, GM stands for General Motors. To a fortunate select few, GM stands for Gardner Murphy, or Great Man. The fortunate ones are the many students of GM, who could be an inspiring teacher without being condescending; whose lecture "notes" might consist of two or three illegible words scrawled on the back of an envelope, but who could end the last sentence of the lecture precisely as the bell sounded; who could draw equally upon Aristotle and Popeye, Japanese art, medieval European agriculture, eighteenth century English philosophy or recent unpublished research by physiologists and geneticists; who could counsel students and enhance their sense of personal worth and direction at the same time; who could deliver hour after hour of brilliant lectures; who truly *cared* about his students, long after they had embarked on their own careers; and who has been more influential than any other American in leading students into psychology.

GM has now come to his sixty-fifth birthday. How should his students celebrate? The method they chose was the Festschrift. The choice is a brilliant one. Let us hope that it

is more frequently used by others in this country who also wish to honor the teachers who pointed the way for them.

This Festschrift is a "26-layer birthday cake," 26 chapters by GM's former students and associates. Each chapter is succinct and pithy, dealing with a theoretical issue of current interest. The range is as varied as GM's own, involving issues in ESP as well as the most "respectable" problems of learning, perception and memory. There are discussions of education, national sovereignty and organization, as well as stress, deliquency and death. Call it a mélange. No matter. There is scope here and a common spirit involving boldness of vision, clarity of thought, and faith in the prospects of discovery. Truly, these chapters convey something of the image which a mentor has tried to communicate to his gifted students and associates.

The editors acclaim him not only as a "catalyst and fomenter of our ideas and research interests" but also "as a person born in the nineteenth century, a product of the twentieth, and indeed a citizen of the twenty-first." Others besides myself will want to partake of this unusual birthday repast and join in a toast to one who has inspired so many.

David Rosenthal

PAUL, IRVING H. *Studies in Remembering.* Psychological Issues, Vol. 1, Monograph 2, 1959. 152 pp. $3.50.

This monograph deals with memory and will interest the psychologist most. The problems, though, are problems for any social scientist who depends upon the reliability of another person's testimony. In particular, these problems should interest the psychiatrist, since trouble spots in memory limit the validity of most case-history data. The monograph provides some unequivocal answers, but even better, it raises important questions with good suggestions for further research.

To appreciate Paul's experiments, the reader should be acquainted with the experiments of Bartlett, the eminent British psychologist. In some of Bartlett's experiments subjects heard and later recalled a simple story. Their recalled versions were then given to other subjects to recall. The procedure was continued through a chain of reproductions—like a rumor passing from person to person. With these data Bartlett showed that remembering is a creative process: the subject tends to assimilate what he hears into meaningful categories and sacrifices accuracy for a neat filing system. Thus, in general, details either drop out or are reshaped to fit in with the subject's "schemas."

One story that Bartlett used, an American Indian folk-tale, was strikingly unusual and unfamiliar. Paul suggests that the very unusualness of this story might make memory seem spuriously unfaithful. He argues that the Englishman and the American Indian have different associations, different attitudes, and different schemas. An Indian folk-tale, therefore, is bound to seem disconnected and ambiguous to the Englishman. The gaps and ambiguities, he feels, induce errors and ommissions in recall. To test this hypothesis, Paul clarified some of the ambiguities in the tale and filled some of the gaps; other important variables were kept constant. Then he repeated Bartlett's procedure with each version of the tale. Subjects remembered more of the new, explicated version than of the original version. (This result embodies a special moral for the psychiatrist: a patient recalling a very unusual or illogical incident will probably distort some of the details.)

The Indian folk-tale in either version is culturally unfamiliar to English-speaking subjects, and Paul wanted to know just how important this unfamiliarity is. He therefore composed a third story, a more familiar one, about two sisters who take jobs abroad. This familiar story was more accurately reproduced than either version of the Indian tale. Paul carefully equated the three stories in many respects. But for some obscure reason

they seem to differ in readability—perhaps only because readability itself is a function of explicitness and familiarity.

Paul also wanted to learn how individual styles of retaining differ. Some people, for example, help the continuity of a recalled story by adding new ideas; others do not. Some people are very redundant in their recall, and others very concise. First Paul had to find reliable descriptive measures. Subjects learned a list of themes and then composed a story based on these themes. Later they recalled the original theme list, their composition, and still another tale that Paul had presented. Various measures of their original and recalled verbal behavior could indeed differentiate reliably among the individuals. The precise predictive value of such scores, however, awaits further research.

The monograph though generally excellent, does have its shortcomings. For one thing, it is not very readable—wordy in some places, repetitious in others, and full of poorly engineered tables. A more serious shortcoming is the imperfect experimental design. In general, Paul's experimental designs allow for one subject per reproduction for each story. From a purely objective statistical point of view, then, no generality is possible, though the differences are large enough to seem intuitively trustworthy. Fortunately, Paul did replicate his experiments, and the major findings were verified. But some of the more minor findings, and certainly the *ad hoc* conclusions, need further experimentation with more subjects, more passages, and more reproductions. Despite these points, however, this reviewer feels that the monograph contributes significantly to our understanding of memory and deserves the serious attention of social scientists.

Leonard M. Horowitz

TAYLOR, EDITH MEYER. *Psychological Appraisal of Children with Cerebral Defects.* Commonwealth Fund, Harvard University Press, Cambridge, 1959. xvii + 499 pp. $8.50.

Dr. Taylor's book is an illuminating and discriminate study on the testing of infants and children with physical and central nervous system impairment. As psychologist she reveals a rare ability to discover the potential and actual intelligence of this group in our testing population. The reading of the book was for this reviewer an experience as gripping as if it had been a novel about the influence of powerful emotional forces in the individual. The reader is made acutely aware of the delicate understanding relationship between Dr. Taylor and a handicapped, seemingly insensible child where communication was established, not through language, but through the medium of blocks, beads, pictures and the other material of the testing laboratory. Something comes through, in the pages of this volume, that is akin to what is now being depicted on Broadway in the drama of Helen Keller's meeting with her famous teacher, Ann Sullivan. Dr. Taylor has the talent to make the impaired child reveal himself. Because children with physical impairment are difficult to evaluate by standard intelligence tests, too often they are thrown in the waste-basket diagnosis of mental retardation. One wonders how many children were spared the consequences of the diagnosis of mental deficiency by being fortunate enough to be seen by her. One can also speculate as to how many were misdiagnosed by the specialist, medical and psychological, who did not have the equivalent skill. For it is easy to become pessimistic and hasty in testing children who have sensory motor handicaps. The child's motor coordination may be so poor that formal testing methods are difficult. And psychologists, like other specialists, are too often the slave of the stop watch, the test norm, and all the standard criteria used to compare one child against his peer. And if the norms and apparatus are abandoned, how does one measure a crippled child, recognizing that the crippled child has to fit into a world designed for

the non-handicapped? Over-optimism can be as defeating as pessimism. Dr. Taylor has not only empathic understanding of the infant and child but awareness as well of the kind of environment the child has to grow in. A child has not only a certain kind of intelligence but also emotional reactions that are colored by his handicap and by the reactions of society. This Dr. Taylor underlines constantly, and her proposals for the education of sick children show her awareness that these children cannot live in isolated circumstances.

The book is divided into two parts. Part I deals with case histories, which present longitudinal studies of children in the various diagnostic categories. Following each case is a discussion of the psychological development of such children from infancy. Thus Chapter I deals with Paul, suffering with spastic hemiplegia, and the details and results of testing done at fifteen months, four years, seven years ahd twelve years. This is followed by a history of Paul's development in terms of his intelligence, physical behavior and limitations, social adjustment, and prognosis for education. The chapter closes with a description of the personality development of the typical child with spastic hemiplegia.

Succeeding chapters deal with the child with extrapyramidal palsy; the child with more serious motor complications plus extrapyramidal lesions; the hydrocephalic child, and three final chapters on children's defects not congenitally acquired or due to birth injury. These last three deal with children who respectively had pneumococcus meningitis at six months, measles encephalitis at five years, and head injury at seven years.

The chapters in Part I will be of great value to the psychologist, the child psychiatrist, and the pediatrician, in providing a picture of what to expect in children who suffer from a specific kind of cerebral problem. Her years of experience have given Dr. Taylor a wealth of information and she has done an excellent job in creating the "typical" child at different age levels. The discussion of the child with hemiplegia is based on the study of the case records of 26 children who were psychologically tested a total of 80 times over the years. Of children with cerebral palsy, case records of 20 were examined who had a total of 50 testing sessions as they grew up. Equivalent numbers of children were examined in the other disease categories. Thus there is an abundance of resource material for the specialist who works with crippled children.

One note of caution could be suggested (which the experienced practitioner will not need). In referring to the social interaction of the family with the crippled child, there is the sometime impression that Dr. Taylor is not entirely cognizant of the psychological meaning the child and its handicap may have to the parents. One needs to be aware how the parents see their afflicted child in relation to their own aspirations, guilt feelings and fantasies. The child can be, and in fact often is, regarded as a fantasy extension of the individual parents. The handicapped child's development, difficult as it often is, can become more frustrating if parents are unable to individuate the child as a person with capacities and abilities of its own.

Part II of *Psychological Appraisal of Children with Cerebral Defects* is titled "Techniques," and deals with the many kinds of tests that can be used, along with a discussion of how to apply them. The tests are sorted into chapters, at first by material category, *i.e.*, Blocks, Paper and Pencil, Pictures, etc. Later, the instruments are categorized by the mental faculty to be tested, *e.g.*, Learning and Meaning, Judgment, etc. Far better would have been a grouping by mental age with sub-heading in terms of faculties to be tested. This section could be a very valuable manual for the tester. Instead, as it is now presented, the material will be difficult to use.

Dr. Taylor does not use the Rorschach or picture material, such as the TAT and CAT, because in her experience she has found the

results misleading and ambiguous. This lack may be a disappointment to the psychologist in the crippled children's clinics or hospitals who does include these tests in his repertoire. She suggests that research is needed in the use of projective tests because of the perceptual distortion such children have. But it is this perceptual distortion that may make possible determination of the emotional disturbances in the severely handicapped child. Dr. Taylor, with her gift of intuitive acceptance and her background of experience and study, could have made more of a contribution had she been more generally accepting of projective techniques. Nonetheless, this volume as it stands is a solid contribution to the literature.

Sol Charen

ERRATUM

TRACZYK NOT TRACHIK

In May of 1959 (**128:** 438–449), JNMD published the first English translation of an article entitled "Functional State of Higher Segments of the Central Nervous System and Adrenopituitary Activity," which had originally appeared in Problemy Endokrinologii i Gormonoterapii (Moscow). The translation was furnished by the National Institutes of Health, Public Health Service, as a part of their Russian Scientific Translation Program. An editorial preface expressed the hope of acquainting Western investigators with some of the work currently in progress in the USSR, and further remarked on the difficulty of "establishing ready communication with the author." This latter has certainly proved to be the case: early in September of this year we received a letter from the author, at the Polish Academy of Sciences, Warsaw, indicating that his surname is *Traczyk*, not *Trachik*, as we incorrectly—and phonetically—misprinted it.

SEVENTH INTERNATIONAL CONGRESS OF NEUROLOGY

The Seventh International Congress of Neurology will be held in Rome, Italy, September 10–16, 1961. The scientific sessions will be conducted in the Auditorium de Via Della Conciliazione (Palais Pius).

The following pertinent information can be offered by the *United States Joint Committee on International Neurological Affairs* at this time.

The Congress will have three categories of membership: *Active*, open to members of the constituent national neurological societies of the Congress; *Associate*, open to qualified physicians and scientists having an interest in the Congress; *Adjunct*, open to interested non-professionals and to families of members of the Congress. Registration fees are $15.00 (or equivalent in Italian lire) for Active members; $10.00 for Associate members; $5.00 for Adjunct members. Banquet and dance will be held in the Palais Des Traditions Populaires, Tuesday evening, September 12, 1961. Tickets for the banquet, $8, dance, $3, total $11, must be purchased at the time of registration. Non-refundable.

United States registration forms are in process of preparation. Registrants may attend free of charge all receptions of the Congress except the official banquet and the evening dance. Registration forms may be applied for and returned with designated fee to the member of the United States national committee designated below. He will also handle the submission of papers to the Secretary General of the Congress in Rome.

Communications will relate to major topics or be free communications. These will be presented according to the DIGEST SYSTEM, 1957 International Congress of the Neurological Sciences, Brussels. Papers are grouped according to subject matter and assigned to a digest director who will synthesize and present the substance of all the papers assigned to his group. Authors of communications will not present the text of their papers except in special instances. All communications, whether related to a major topic or not, will be published or summarized in precirculated booklets provided they reach the Office of the Secretary General of the Congress on or before April 15, 1961.

Titles and 1000-word texts of all communications *in triplicate* should be submitted to the designated member of the United States national committee before *March 15, 1961* to be forwarded by him to the Secretary General of the Congress in Rome. We are informed that those related to the major topics will be given priority over free communications. If texts are not written in English or French they should be accompanied by 500 word summaries in these languages.

Designated to issue forms, receive registration applications and fees, and to receive and transmit communications to the Secretary General is:

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